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Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

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19 July 1984

WORLDWIDE REPORT

NUCLEAR DEVELOPMENT AND PROLIFERATION

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PEOPLE'S REPUBLIC OF CHINA

OFFICIALS SCORE DELAY IN NUCLEAR PACT WITH U.S.

Foreign Ministry Statement

OW201010 Beijing XINHUA in English 0949 GMT 20 Jun 84

[Text] Beijing, June 20 (XINHUA) -- A spokesman from the Chinese Foreign Ministry today expressed regret that the Sino-U.S. agreement on cooperation in the peaceful use of nuclear energy had still not been signed. He said this at a weekly news briefing here this afternoon.

"All the relevant questions," he said, "have been fully discussed and resolved in the course of negotiations between China and the United States. It was on this basis that the two sides initialed this agreement in Beijing. The responsibility for failing to sign the agreement formally up to now does not lie on the Chinese side.

"After the agreement had been initialed, the U.S. again raised the question of ensuring a full understanding with China on the execution of the agreement, thereby raising unnecessary new issues. We express our regret at this."

Answering an earlier question about Chinese nuclear policy, he said that it was very clear. He went on to say that Premier Zhao Ziyang had made open and explicit statements on the position of the Chinese Government on this question.

On May 15 this year, said the spokesman, Premier Zhao categorically reaffirmed the solemn, principled position of the Chinese Government in his report on government work to the Second Session of the Sixth National People's Congress in these words: "China is critical of the discriminatory treaty on the nonproliferation of nuclear weapons concluded in 1968 and has declined to accede to it. But we by no means favor nuclear proliferation, nor do we engage in such proliferation by helping other countries to develop nuclear weapons."

Li Peng Comments

OW201324 Beijing XINHUA in English 1303 GMT 20 Jun 84

[Text] Beijing, June 20 (XINHUA) -- Chinese Vice-Premier Li Peng today answered questions concerning China's nuclear policy and its nuclear cooperation with the United States and other countries, during a meeting with a group of Japanese journalists.

He met a Japanese delegation from KYODO NEWS SERVICE led by Teruo Okumuya, chief of its editing committee, here this afternoon.

He said China was rich in hydro-electric power reserves and coal resources, and had already developed its nuclear energy to a certain degree, to supplement traditional sources of energy to power China's industry. By the end of this century, it will be possible for China to build nuclear power stations with a generating capacity of 10 million kw containing 10 to 12 sets of generators, he said; the first three would be built in Guangdong, and the eastern and northeastern parts of China, respectively, each including two generating units.

The Chinese vice-premier also expressed the hope that people inside and outside the U.S. Government would dispel obstacles to promoting an early signing of the Sino-U.S. agreement on cooperation in the peaceful use of atomic energy. The agreement, initialed in late April in Beijing during President Reagan's visit to China, is now being held up by objections in the U.S. Congress. Li said that the agreement would benefit both countries. Undue delay would mean that the U.S. would be the first to suffer the financial loss, he stressed.

Speaking of Sino-Japanese cooperation in the peaceful uses of nuclear energy, Li Peng said the two countries should first of all reach an agreement in this field by common efforts, so as to create conditions for the cooperation which has bright prospects.

Present at the meeting was Deputy Director General of XINHUA (NEW CHINA) NEWS AGENCY Yang Jiaxiang. The Japanese delegation arrived here yesterday at the invitation of XINHUA.

CSO: 5100/4133

RADICALS TO RESUBMIT 'UPDATED' 1974 NUCLEAR DRAFT BILL

Buenos Aires INFORME INDUSTRIAL in Spanish No 71, Dec 83 pp X-XIII

[Text] Nine years ago, on 15 November 1974, the then Radical opposition legislative group submitted a bill on "National Nuclear Policy" to the Congress of the Nation for its consideration. The so-called Parliamentary Act No 58 acknowledged the authorship of Deputy Carlos A. Fonte, and its constitutional section had been revised by Dr Jorge Vanossi.

Its uncertain fate at that time, the bottom of some desk drawer, has been corrected. At present, that bill is the basis on which a select group of Radicals who are also affiliated with the National Commission for Atomic Energy [CNEA] is working. Through formal amendments aimed at its "aggiornamento" [updating], the bill (suitably revitalized) will again be submitted to the Congress for consideration.

The Bill

The complete text of the resolution portion of the bill submitted by the then National Deputy Fonte is as follows:

1. On the national nuclear policy

Article 1. The production, development, use and control of nuclear energy, for the purpose of achieving autonomy in decision-making on the subject, is declared in the national interest.

Article 2. The national nuclear policy for production, development, use and control of nuclear energy is intended to foster the maximum contribution to the general welfare, to improve the population's living standard and to ensure the common security.

To fulfill these goals, the following guidelines are established:

a. Production of nuclear electric energy, through the construction of nuclear powerplants whose reactors will use natural uranium, adopting prototypes that can be developed with our own technology;

- b. Absolute independence in the management of the fuel cycle;
- c. Optimized use of different energy sources and nuclear materials, in an integrated plan that will make it possible to incorporate the use of nuclear energy and, simultaneously, develop the national nuclear technology;
- d. The native industry's participation in the formation of a high-level nuclear industry with suitable capacity for technological innovation;
- e. Establishing and promoting companies with native capital, also associating with them, to cover the areas or sectors that will allow for total integration of the nuclear processes;
- f. Ensuring the development of the research necessary for attaining an independent nuclear technology on all levels;
- g. Ensuring the use of the benefits accrued from the application of radiation and radioisotopes in the various areas of national activity;
- h. Ensuring protection of the population and the environment from the risks stemming from the utilization of nuclear phenomena.

Article 3. The following will be the exclusive, inalienable property of the national state:

- a. The deposits of nuclear ores;
- b. The nuclear facilities that produce, process or use fertile or fissionable materials, and those which the National Commission for Atomic Energy specifically considers strategic for the implementation of the national nuclear policy and, in particular, for the materialization of the nuclear electric program;
- c. The technological permits and patents associated with nuclear phenomena and their applications.

Article 4. The national state will exercise absolute monopoly over the nuclear technologies and permits developed or acquired, neither now or in the future, and over the use of them in the manufacture of those components that are regarded as strategic for the fulfillment of the national nuclear policy.

This monopoly will apply, with the limitations contained in this law, to the processes of management, execution and control of decisions, both directly and indirectly associated with the national nuclear policy, whether it be in the realm of input, facilities, projects, engineering, research, operations, discoveries, permits, uses or applications, or any other related area.

II. Definitions

Article 5. For the purposes of this law, the following definitions have been formulated:

a. Nuclear powerplants: they are any nuclear facility used to generate nuclear electric power.

b. Fuel cycle: it is any process ranging from prospecting for nuclear ore to the processing of the fuel elements and their reprocessing.

c. Strategic components: they are anything that is declared to be such at the discretion of the National Commission for Atomic Energy.

d. Nuclear phenomena: they are any manifestation associated with the physical processes for conversion of atomic nuclei.

e. Nuclear industry: it is any industry whose operations contribute to the production of:

1. Nuclear fuels in any of their phases;
2. Any other component of nuclear facilities considered strategic by the National Commission for Atomic Energy;
3. Radioisotopes and sealed sources of radiation and equipment used for their application;
4. Equipment used for radiation metrology.

f. Nuclear facilities: described as such are the nuclear reactors, factories for the manufacture or processing of nuclear substances, and the separation of isotopes from nuclear fuels, the factories for reprocessing irradiated nuclear fuels, the heavy water plants, the plants for production of radioisotopes and sealed sources, the industrial facilities for gamma radiation, and the premises and facilities used to store nuclear substances.

g. Nuclear island: it is any group of nuclear facilities of a nuclear powerplant used to generate steam, and their auxiliary service facilities that do not comprise conventional facilities.

h. Materials of nuclear interest; they are any chemical element, its compounds or alloys which the National Commission for Atomic Energy considers strategic for preparing components of nuclear facilities.

i. Fertile material: it is anything containing elements such as thorium 232 and uranium 238, which are not fissionable but which, through the capture of neutrons, can be converted into such fissionable materials.

j. Nuclear material: it is any fertile or fissionable element, such as uranium, thorium, plutonium and their compounds and alloys, or ores containing them.

k. Basic nuclear ore: it is any substance naturally deposited which contains fertile elements, such as uranium and thorium, suitable for the preparation of nuclear fuels.

l. Reactors: they are any facility used to cause fission processes and having the capacity to maintain a self-supported chain reaction.

m. Nuclear technology: it is any technological process associated with the nuclear industry.

III. On the National Commission for Atomic Energy

Article 6. The National Commission for Atomic Energy is the specific agency for implementing this law, with the capacity for public and private activity, operating with complete administrative autarky and directly and exclusively subordinate to the president of the nation.

Its functions are:

- a. To plan and carry out the study and utilization of nuclear phenomena in their multiple applications, particularly with respect to the generation of nuclear electric energy and the use of radiation and radioisotopes;
- b. To participate with other state agencies in the preparation and updating of the national energy plans;
- c. To engage in research work aimed at the formation of groups that will have the necessary disciplines and techniques with which to attain mastery of the nuclear technology and its applications;
- d. To engage in development work on advanced engineering, including the fields necessary for achieving an independent nuclear technology and ensuring its future advancement;
- e. To execute and contribute to the complete development of the projects, including the phases ranging from the laboratory scale to that of the pilot plant, so as to reach the industrial phase with a maximum amount of native technology;
- f. To ensure the training and constant improvement of researchers, professionals, technicians and suitable personnel, through courses, grants and interaction with universities, state agencies and other institutions;
- g. To direct the transfer of technology toward uses in medicine, agronomy, biology, geology, industry or other areas, to state entities and, under permit when it is deemed appropriate, to the private sector, so as to attain the quality standards that it has established;
- h. To develop techniques and promote the intensive use of applications of radiation and radioisotopes in industrial processes, medicine, agronomy and geology;
- i. To execute and improve the metrology of ionizing radiation and to incline toward the use of its services;

j. To set guidelines and participate in the preparation of legislation concerning the national nuclear policy, both in the energy field and that of applications, and to negotiate the issuance of pertinent supplementary standards;

k. To arrange agreements with other agencies or countries for the purpose of transfer or cooperation in the development of applications for radiation and radioisotopes;

l. To participate in congresses, conventions, seminars, meetings and international agencies whose purpose it is to improve or exchange scientific information;

m. To control and oversee the utilization of nuclear phenomena, making certain that it is carried out under conditions that allow for suitable protection of the environment and guarantee the security of the population in general and of the workers associated with these activities in particular.

Article 7. For purposes of better fulfillment of the stipulations contained in Article 1, the National Commission for Atomic Energy will have the most extensive powers of action and decision and, in particular:

a. To construct, subject to the National Energy Plan, nuclear powerplants, including the execution of all the preliminary phases, design, construction, installation and putting into service.

In the event that the National Commission for Atomic Energy is not the operator, it will be required to render technical assistance and to oversee the activity of the operating entities, so as to ensure the proper operation and maintenance of the nuclear island.

b. To grant permits for operation of nuclear powerplants to other state entities;

c. To grant permits to public or private institutions to construct or use facilities intended for the utilization of nuclear phenomena;

d. To prospect, evaluate and exploit the basic nuclear ore deposits and others of particular interest to the nuclear industry;

e. To execute all the preliminary phases, design, construction, installation and putting into service of industrial facilities used for ore concentration and purification of concentrates, conversion to uranium oxide or other types of fuel material, manufacture of irradiated fuel elements, handling of fissionable material and management of radioactive waste;

f. To carry out all the preliminary phases, designs, construction, installation and putting into service of industrial facilities intended for heavy water production;

g. To produce radioisotopes and tagged compounds, and to develop and construct sealed radiation sources;

h. To execute all the preliminary phases, design, construction, installation and putting into service of industrial facilities and machinery intended for generating and applying ionizing radiation and necessary metrology equipment.

Article 8. Without precluding the stipulations in the foregoing article, the National Commission for Atomic Energy, acting in a public and private capacity, may:

- a. Appoint and remove scientific, technical and administrative personnel on a temporary or definitive basis;
- b. Issue its internal regulations and establish its organizational structure;
- c. Arrange agreements with public or private entities, and conclude the contracts necessary for serving its purposes;
- d. Form associations with other state or private entities, making a capital contribution;
- e. Engage in commercial acts, as a result of the contracts that it concludes, which are inherent in the purposes stipulated in this law;
- f. Engage in all the legal acts necessary for its normal operation.

On the Structure of the National Commission for Atomic Energy

Article 9. The National Commission for Atomic Energy will be directed by a board of directors comprised of six members, appointed by the president of the nation, after prior consent from the honorable Senate of the Nation.

They will remain in their office 6 years, and may be removed at the decision of the president of the nation.

Three members of the first board of directors will be appointed for half of the legal term so as to allow for its partial replacement, in halves, every 3 years.

Article 10. The board members will be of Argentine nationality and must attest to their proven experience and academic or research level in the field.

The status of board member is incompatible with the discharge of any other activity, profession, employment or rendering of services, under any title.

Article 11. The president of the nation will appoint the board members who will act in the capacity of chairman and vice-chairman.

The chairman will exercise the agency's legal representation.

Article 12. The commission's executive and administrative work will be done under the coordination and responsibility of a general manager appointed and removed by the board of directors of the National Commission for Atomic Energy.

Article 13. The commission's specific activities will be carried out through no more than eight (8) areas, each run by an official appointed by the commission's board of directors who will be responsible for the performance of the work decided upon by the commission.

These areas will include, among others: reactor engineering, applications of radiation and radioisotopes, fuel cycle, radiological safety and heavy water.

Article 14. The organizational structure of the National Commission for Atomic Energy will be joined by the Directorate of Internal Auditing and Management Control, run by an official with a degree as a public accountant, appointed by the board of directors and answerable to it.

Its functions, among others, will be to carry out concomitant checking of the fulfillment of all the regulations emanating from the National Commission for Atomic Energy and the terms of concessions, permits, contracts and agreements that it executes or concludes.

Article 15. The National Commission for Atomic Energy is excepted from the provisions of Decree-Law 6,666/57 and supplementary provisions, and from those of Law 17,063.

Article 16. The National Commission for Atomic Energy will have the authority to consider any material as being of nuclear interest, in which case it will establish requirements, standards and provisions for its control.

Article 17. The National Executive Body, based on a request with grounds submitted by the National Commission for Atomic Energy, is authorized to declare as being a public utility subject to expropriation, any invention or discovery that it deems of strategic value for the generation of nuclear electric power, the use of radiation and radioisotopes and the utilization of nuclear phenomena in their multiple applications. The National Commission for Atomic Energy will appropriate the invention or discovery, making the pertinent compensation.

Article 18. There is a categorical ban of the manufacture, marketing, use, exploitation or activity under any title involving nuclear material, its by-products and nuclear facilities, except for the material cited in Decree 842/58, without prior consent of the National Commission for Atomic Energy.

For this purpose the approval will be granted by means of permits, with a necessary guarantee for the complete control on the part of the National Commission for Atomic Energy over all activities, including proof of destination.

V. Funds

Article 19. The following are funds of the National Commission for Atomic Energy:

a. The individual amounts appropriated for it in the budget of the nation;

- b. The revenue originating in the economic and commercial use of patents, permits, consultation, rendering of services and any other resulting from the activity carried out by the National Commission for Atomic Energy;
- c. The funds derived from or allocated as a result of the enactment of special laws;
- d. The income awarded to it to engage in research and studies;
- e. Donations and bequests.

VI. General Provisions

Article 20. The discoveries and inventions resulting from its activity or from the execution of agreements or contracts, or from its participation in associations.

The National Commission for Atomic Energy is authorized to establish the amount of the compensation when this is appropriate.

Article 21. When there is no agreement on the compensation set by the National Commission for Atomic Energy, by virtue of the implementation of Articles 17 and 20 of this law, the party concerned may claim the right of appeal before the National Chamber of Appeals of the federal jurisdiction, with headquarters in Buenos Aires, in courts of administrative litigation.

In this instance, and within 48 hours of the notice of the appeal, the National Commission for Atomic Energy must deposit in the records 70 percent of the established compensation, which will be freely available to the appellant.

Article 22. The compensation will be set by the National Chamber of Appeals, after a prior opinion from experts proposed by the parties and the official ones that the court deems necessary.

Article 23. The National Atomic Energy Commission will submit an annual detailed report to the honorable Congress of the Nation regarding the status of the projects being executed, agreements concluded, permits granted and, in general, the activities being carried out.

Article 24. Within 120 days of the promulgation of this law, the Executive Body will undertake its regulations and will issue the rules of financial and contractual administration that will govern the operation of the National Commission for Atomic Energy. It will also propose the legislation making exceptions to the general rules governing the operation of the national administration.

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CSO: 5100/2115

NUCLEAR CHIEF QUIHILLALT ON PROSPECTS FOR NUCLEAR PLAN

Buenos Aires A FONDO in Spanish Apr-May 84 pp 63, 65

[Interview with Oscar Armando Quihillat, head of NUCLAR, S.A.; date and location unspecified]

[Text] Perhaps the only thing that operated in a constant, consistent line, with steady growth in the erratic Argentina of the last quarter of a century was nuclear development. From the creation of the National Commission for Atomic Energy until the present, the plans devised by the sector have been upheld from the standpoint of their guidelines and general direction, and have been fulfilled, amid the progress and setbacks in the rest of the country. The accomplishments made prompt us to reflect on the kind of Argentina that we would have if everything had operated with that kind of continuity: Nuclear powerplants in service and under construction; complete fuel cycle; Latin American leadership in the field; and growing technological independence from the centers of world power.

Today, nuclear development does not appear to be "officially" threatened (see statements by Secretary Storani in this same issue); but it is undergoing the general crisis in the country, with a future that seems to make its importance relative within the national energy equation. Engineer Quihillat, president of NUCLAR, S.A., supplier of engineering for the atomic powerplants, explains the present situation and the need for maintaining the growth of a sector which, based on several preliminary phases involving the transfer of technology, has managed to develop independently, as a result of effort and research in all phases of the nuclear industry.

A FONDO: There has been a great deal of discussion about "threats" to the continuity of the Argentine nuclear plan. What is the real situation?

Quihillalt: At present, the sector is not escaping the general crisis in the economy, and we in the sectors of private industry associated with CNEA are experiencing a bad time. CNEA's delays in its payments to companies which depend on it, such as ENASE (Argentine Nuclear Enterprise for Electric Powerplants), or Sulzer, associated with the heavy water plant, have caused those delays to be transferred to the companies such as ours, which are suppliers to the sector, creating a very delicate situation.

AF: What are the immediate prospects?

Q: Thus far, only rumors of one kind or another about the place and the importance that the nuclear sector will have in Argentina's energy future. I think that, in the end, a highly dynamic sector such as this (at Embalse, our company alone employed 1,400 men for 2 years of work) will not be neglected by the present authorities; particularly when that would mean reopening a technological gap that 25 years of hard work have virtually managed to close; something that is not common in the world.

AF: Isn't the transfer of technology, about which so much has been said, sufficient to close that gap?

Q: By no means; in nearly all instances, what the transfer of technology to less advanced countries does is establish dependence and widen that gap even more. What is transferred is always technology on the way to becoming obsolete and its cost allows the supplying nation, with new revenue, to hasten the development of new advanced techniques.

AF: Then if the transfer does not help, what is the way to close that gap?

Q: It is not that the transfer does not help; rather, it does not suffice. The transfer of technology is merely a basis, a starting point for closing the gap. Based upon it, the course of action is precisely the one that the Argentine nuclear sector has pursued for a quarter of a century: to apply a tremendous effort for research ranging from pure science to industrial implementation, to achieve a development paralleling that of the leading countries, but autonomous in its present and future growth.

AF: In other words, from your standpoint, a crisis in nuclear development would not be merely a sectorial problem, but rather a substantial retrogression in perhaps the only industrial sector in which Argentina has achieved substantial autonomous development.

Q: That exactly. But let's trust that, when the status of the government's decisions is clarified, nuclear energy (and all scientific, technical and industrial progress, as well as all the concrete sovereignty that it represents) will have the preponderant position that it deserves. Essentially, let's trust that good sense will triumph.

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CSO: 5100/2115

LEGISLATOR PROPOSES CONGRESSIONAL NUCLEAR ENERGY COMMISSION

Buenos Aires CLARIN in Spanish 1 Jun 84 Special Supplement p 10

[Text] We Argentines have noted that the president of the nation has made the decision not to ratify the Treaty of Tlatelolco, nor to sign the Treaty for Nuclear Non-Proliferation. [TNP].

Accepting that information as true, we are gratified by that decision, which is an essential part of the establishment of a proper policy in the nuclear area, aimed at spurring and preserving our development and independence in that field.

With this announcement (which we trust will be borne out by deeds), we have taken an all-important step; but we think that this, which we might term a defensive position, will not suffice.

Hence, we consider it imperative for the Executive Body to give a positive response to the draft resolution which the Peronist bloc, through me as an intermediary, submitted for the consideration of the Chamber of Deputies during this last week of May.

Our proposal suggests the holding of an immediate conference of Latin American countries, meeting in Buenos Aires, for the purpose of incorporating amendments into the Treaty of Tlatelolco, which will direct it back to the purposes and the spirit that gave rise to it, and remove the distortions that were introduced into it, particularly in the area of safeguards, which turned it into a mere appendage of that monument to injustice and discrimination in the realm of international law and policy, namely, the TNP.

That proposal, moreover, is supplemented by the two bills that we already submitted some time ago to the Chamber, and that have not yet been considered by it, owing to the delays in their handling which the majority bloc has caused.

One of the bills proposes the creation of a Bicameral Standing Commission on Nuclear Energy (submitted on 11 January and not yet discussed), whereby we want it to be the people who are responsible for setting and controlling the national policy in the area; because there is no one better than the people to oversee its strictly peaceful use.

The second is a bill (submitted on 8 March) whereby it is asserted that our country "considers nuclear energy the leading practical instrument for eliminating all energy dependence, to contribute to the structural modernization of its productive system, to maintain the quality and life expectancy of the population, to affirm a new route for the nation's foreign trade, to support Latin America's integration and to create a valid, independent alternative for the energy needs of the Third World countries." But, at the same time, there is assumed the formal, explicit commitment that all Argentine nuclear development, both present and future, will be used for peaceful purposes; a decision which, when the bill is passed, will be incorporated into the Constitution on the occasion of its reform. Finally, it establishes a bilateral system for individual safeguards to be underwritten by our country with its suppliers or recipients of nuclear technology or supplies, which will have to be approved by law in every instance.

We are convinced that these three proposals, which form a harmonious whole, are the necessary complements whereby our country (in addition to not ratifying the Treaty of Tlatelolco as it exists at present and not signing the TNP) will affirm the policy of independence in the nuclear field, supplemented by an orientation based on active peace, as opposed to the hypocritical proposal to "disarm the disarmed," made by the major owners of nuclear weapons meeting at the London Club, and promoters of that international version of the doctrine of national security, namely, the policy of non-proliferation.

In conclusion, I cannot fail to cite our concern over and rejection of the excessive, irrational cuts made in the budget of the National Commission for Atomic Energy. This action, which we shall debate when the national budget is submitted to the Congress, could become the effective substitution for the ratification of Tlatelolco and the signing of the TNP; because to deny the minimal funds essential for our nuclear development will have the same effect that the powers wanted to achieve with the imposition of those two international standards: to thwart our accomplishments in the field.

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CSO: 5100/2115

NUCLEAR EXPERTS DISCUSS FUTURE OF NUCLEAR PLAN

Buenos Aires ENERGEIA in Spanish No 44, Mar 84 pp 1236-1245

[Text] With the object of exchanging views on the situation in the nuclear sector, ENERGEIA convoked a group of specialists, businessmen and political leaders, who, after the debate, took part in a luncheon that straightaway became the continuation of that debate. Present were: Dr Jorge Martinez Favini of the CNEA [National Commission for Atomic Energy]; Dr Jaime Pahissa Campa, president of the AATN [Argentine Association of Nuclear Technology]; Engineer Valentin Kunica, of TECHINT [expansion unknown]; Engineer Juan Jose Buguna, chairman of the Argentine Board of Consultants; Dr Gabriel Bidone, of Industrial Gases; Messrs Dan Robinson and Barry Jacobs, executive vice president and project manager, respectively, of AECL [Atomic Energy of Canada Limited]; Erhard Gaedtke, general representative of KWU [Kraftwerk Union]; Adm (Ret) Raul Fitte, of ARGATOM [expansion unknown]; Dr Alfredo Carella, expert in the field of nuclear law; Engineer Jorge Gaspar, independent consultant; and, moderating the round table, Luis Fernando Calvino and Martin Yriart, of ENERGEIA. The round table and the subsequent luncheon were held in the meeting rooms of the Hotel Libertador.

[Calvino] As I see it, the nuclear sector is presently in a state of turbulence. On the one hand, it is awaiting imminent definitions on the part of the Government, and on the other hand, it perceives signs of the advent of antinuclear expressions. We are gathered here to examine this situation.

[Yriart] During the previous Administration, there was a period of extensive protectionism and state control in the nuclear sector, and many felt that this viewpoint would contribute to a strengthening of the sector; but others --like myself--felt that such a policy could create a giant with clay feet.

This situation raises a question in the minds of the businessmen of the private sector who cooperated with the nuclear developmental effort, and the question is: How much governmental protectionism does the nuclear industry need to subsist as such, and what would justify this protectionism?

[Bidone] I would not say that, to date, we have had a heavy-handed governmental protectionism. Yes, there has been a centralization of all nuclear activities in a single governmental body. On the other hand, one can hardly talk of an oppressive protectionism if one considers that we have needed and still need substantial technological support from abroad. This is as evident in basic engineering, which comes from abroad, as in regard to certain criteria of selection for the manufacture of nuclear components. However, we can refer to it as a moderate protectionism--I would call it a balanced protectionism--of the nuclear industry, since it would be totally impossible to think in terms of a local development of this industry without the possibility of recourse to a government that will aid in bringing this about.

Since we are anxious that the country develop only a single nuclear industry to satisfy its own internal demand, the private sector, through the AATN, has tried to develop a sort of joint effort with other countries, especially Latin American ones. It is in this regard that we have not yet seen any government policy supportive of this integration with other countries, and we consider this to be fundamental since, and I emphasize this, in the absence of an integration with other nations, it is going to be practically impossible to achieve a full development of our nuclear sector.

[Calvino] Recently, the secretary of energy stated that upon completion of Atucha 2, no more nuclear power generating plants would be built. Based on this hypothesis, what can the nuclear sector look forward to?

[Kunica] Dr Storani's statement coincided with a plan the AATN had been studying to clarify in various circles the situation within the sector. Hence, the publication of a petition by the AATN a few days following Dr Storani's statement, which went so far as to use a term, a dreaded one, perhaps, which enlisted no sympathy, and which was "We are nearing a nuclear crisis."

During those days, other statements were issued on the subject, like the opinions of the heads of groups within the two parties. No strictly official denial was issued, however, although the Energy Secretariat, through its undersecretary for energy planning, Engineer Jorge Lapena, stressed once again the need to continue with the development of the Nuclear Plan.

This clarified the situation with respect to its energy aspects. But we, as representatives of the sector, want to point out that the Argentine nuclear industry is not limited to the energy area alone; it encompasses other areas of major importance as well, such as medicine, industry, pharmaceuticals, etc. This, which we refer to as "reproductive activity," forms part of the peaceful use of nuclear energy by our industry and comprises another important function of our sector.

[Pahissa Campa] Adding to Kunica's reply, we would have to say that Storani's statement was followed by a weak denial (a small insert in the daily LA RAZON) stating that the Energy Secretariat denied the statements

attributed to Storani, emphasizing that the comments on the subject by the various publications reporting the alleged statements were the responsibility of the publications themselves.

Although there was indeed this denial, an article published in the daily EL CRONISTA COMERCIAL called attention to a leak from the Finance Ministry, in which it was said that Finance concurred with Energy insofar as concerns a halt after Atucha 2. This article, which included figures and reports containing a few errors, was challenged by our Association in a statement published in the same daily.

I point this out because while on the one hand Engineer Lapena says work is to continue on the Nuclear Plan, and a denial was forthcoming, the Ministry of Economy, on the other hand, appears to be backing the possibility of suspending the Nuclear Plan after Atucha 2.

The only thing we have countering the latter is the statement by the chairman of the CNEA, Engineer Alberto Constantini, who assured the personnel of the CNEA and me in particular, as president of the AATN, that the Nuclear Plan would not be touched.

[Martinez Favini] I would like to point out that, aware of the existence of apparent contradictions in the nuclear sector, I tried to come here today with something new. This morning, Dr Jorge Sabato, who is a member of the Tripartite Commission designated by Decree 159/83 to ensure the priority of the decision by the president of the Republic to preserve the Nuclear Plan, notified me that the policy decision to continue with this Plan remains firm, but that its implementation is encountering known budgetary difficulties, specifically on the part of Treasury.

[Pahissa Campa] This is a positive statement, but I consider that there is still need of an official statement by the Government. This would do very much to tranquilize the sector.

[Bidone] What Dr Martinez Favini has just said is of the utmost importance, because if the technical analysis of the Plan has now been completed and no objections, or at least no major objections, have been found, and if a decision exists to continue with the Nuclear Plan, this means that only the budgetary problem remains.

As for this problem, I believe it can also be resolved through an adequate integration of everything connected with the Plan, and the Plan itself made part of an integration with other countries that are involved in nuclear developmental programs. Besides, it must be remembered that there exist, in other countries, large firms that are prepared to participate financially in the development of our nuclear program.

[Carella] Deputy Julio Cesar Araoz, who is vice chairman of the Chamber of Deputies Commission on Energy and Fuels, has issued several statements pointing toward the continuation of the Argentine Nuclear Plan...

[Calvino] How many power plants do you estimate should be built between now and the year 2000?

[Carella] Some 8 or 9 years ago we made a study, in which we estimated that six additional nuclear power plants would be needed between then and the year 2000; six, that is, instead of four.

It was our view that these nuclear power plants would be needed in addition to the development of all the country's energy resources, including those of a hydroelectric nature. Everything depends, of course, on the type of country we intend to be. If we want to be a depressed country, perhaps it will not be necessary to build even the hydroelectric plants; but if we embark on a program of dynamic growth, there can be no doubt that we will need to have an adequate supply of energy, and this will mean that nuclear energy will have to be made an active component of that supply.

In this regard, I want to point out that certain of our statements--misinterpreted, of course--were criticized on the assumption that we are advocates of nuclear energy to the exclusion of all other forms, but that this is not true. We view nuclear energy as being within the general context of energy sources, which further includes other nonconventional sources as well, such as wind power, ocean power, solar power, etc. These sources could be candidates for participation in the supplying of energy, but the big future contribution would have to come from highly centralized sources, such as hydroelectric and nuclear electric plants.

But what worries us--and I think this could very well be a worthy topic at this round table--is being able to identify the objectives Argentina must set for itself with respect to nuclear development. In a way, this requires defining the industrial model of the country, since if we are going to retain the model of a country with a smokestack type of industrial base, any talk of nuclear energy might lack coherence, because such a sector would become a true island athwart the general course charted by the country. If on the other hand we lay out a national plan based on high-technology industry, then nuclear energy and everything it entails will contribute a definite and justifiable share to the energy supply.

If we opt for a modern society, I don't think we will have any real problems, since even our budget-related ones will shrink, since investments will have to be channeled into four or five specific areas and our efforts and money not dispersed among many subsectors for lack of clearly defined policies. The budgetary crises that strike key sectors in our developmental effort year after year must be done away with, and this will require definitions.

[Yriart] Going back to Carella's comments and to the sense of the question I raised at the start of this round table, I ask the representatives of the AATN: What is your projection of the country's energy needs over a reasonable period? and: What role do you assign to nuclear energy during that future period? This is basic to defining the investment plans that would give this industry a reason for being.

[Pahissa Campa] The problem is very complex and it must be addressed by parts. In the first place, I believe the slump in energy demand of the last few years is a temporary one and cannot be taken as a basis for projecting energy consumption over a period, for instance, of 50 years. Of course--as Carella has said--much will depend on the kind of development the country decides to embark on, but Argentina is certain to resume in the not too distant future its real rate of consumption, which, obviously, is not its present one.

I estimate that the rate of growth of demand, even from a purely vegetative standpoint, will be such that our water-power resources will be exhausted by the end of this century or beginning of the next, and this would necessitate--according to one calculation--installing one nuclear power-generating plant every two years or, beginning 5 to 7 seven years from now, one nuclear plant every year.

Therefore, the decision we must make today is whether to build those plants ourselves or to buy them abroad. If we buy them, we will continue the dependency we have always known; and if we are going to build them ourselves, we must start strengthening our nuclear industry as of now.

If we consider the money we have invested to date in the development of this industry, in the aid the state has provided to enable it to attain ever higher levels, we must ask ourselves whether it would make any sense to run the risk of losing all that effort.

So much for the country's purely domestic needs; but the question does not end there. Some years ago the country had to face the dilemma of "natural versus enriched uranium," and wisely opted for natural uranium. The rest of the countries of the world that are not sufficiently equipped technically will probably make the same choice. At that point, if it now consolidates its nuclear industry, Argentina becomes a potential exporter of that technology.

Thus, by supporting, protecting, sheltering our nuclear industry, we will not only resolve our domestic energy supply problems but, with an eye on the future, we will be developing a future export line that can have a major impact on our economy. This is true because Argentina has not only developed its ability to build power-generating plants, but has also had the foresight to develop the entire nuclear cycle.

[Calvino] What would be the impact of this advantage?

[Pahissa Campa] Such an advantage qualifies the country to become an industrial exporter to those markets that do not control the entire cycle, like, for example, Korea, which, although it has four power plants in operation, does not have its own production of fuel elements. And when I say Korea, I mean any other country that would tend toward the choice of natural uranium. Of course, I discard Latin America, which for diverse reasons, will tend to opt for a technology like ours.

This is why every kilowatt of energy of energy produced by our nuclear power plants between now and the end of the century must be considered a by-product the purpose of which is to finance the development of the nuclear sector. This development will cost, during that period, some \$7 billion, of which only some \$2 billion to \$2.5 billion will be spent abroad; the rest will be invested inside the country. Furthermore, that figure of \$7 billion will be self-financed from the proceeds of the electricity produced by the power plants in operation.

[Martinez Favini] My many years of experience in the CNEA and my personal experience as a citizen indicate to me that the two major Argentine political movements--Radicalism and Justicialism--share identical views as to the industrial model the country must adopt. Both concur that we must be a developed, aggressive and modern society.

[Calvino] Let us remember that the first investments in connection with Atocha 1 were made by the Government of Dr Illia.

[Martinez Favini] That is true. We never forget the 1965 decree, signed by Dr Illia, which enabled the prior feasibility studies for that power plant.

Well now, in view of the concurrences between these major parties, and the fact that the bottleneck stems from a budgetary problem, the question we must ask ourselves--as France did in its turn--is whether, for Argentina, nuclear energy is a matter of state; and I think we would all concur in answering that it is.

This is one aspect of the matter. In addition, we must take into account the international reaction as expressed in commentaries, pressures, etc, like those of 18 November following the Government's announcement of the operation of our uranium enrichment plant. This event was treated abroad with a certain degree of bad faith because our success was given the character of a technical achievement with military aims. This compelled the new Government to emphasize that the new step taken has no military objective whatever. But more than that, the rarefied climate that resulted has given rise to the creation of an independent body, to Parliamentary control, to the creation of a commission that does not include members of the CNEA. Regrettably, and despite all this, the rarefied climate still persists and makes itself felt.

[Bidone] It would be interesting to hear from the representatives of foreign firms who are seated here at this table, with respect to the impact and far-reaching political and economic effects this forward leap of our nuclear industry may have generated.

[Robinson] I would say that in Canada the news concerning the uranium enrichment technology has produced a relatively minor impact. As soon as it became known--on 19 or 20 November--a mere few lines in the press reported the event and, clearly, it is not a topic being discussed.

[Carella] Could this be signaling a change in Canada's policy towards Argentina, inasmuch as the Canadian Government, in 1976, adopted a decision to the effect that it would not engage in any sort of export of technology or supplies to those countries that have not signed total-safeguard agreements or the Nuclear Nonproliferation Treaty?

[Robinson] No, I don't think this should be interpreted as a change in policy. The policy continues to be the same. The only thing that to some extent might be said regarding the policy is that one hopes there will be a bit more flexibility in the future than there has been in the past. Owing in part, perhaps, to possible changes in government in Canada together with the changes that have occurred in Argentina.

[Carella] A flexibility similar to that shown by Germany with respect to Atucha 2?

[Gaedtke] In Germany as well, the subject of the uranium enrichment plant announced by Argentina did not give rise to discussions, probably also because Argentina's spectacular achievement was not widely publicized. According to our information, Germany also is not contemplating changing its policy on the basis of this new situation. This indicates that Germany is adhering to its policy of favoring independent development in the countries with which it works as partners. We, as a business firm and as partners, in a way, in Argentina's nuclear development effort, are experiencing no problems of any kind whatever with the German Government. At the same time, I want to emphasize that we will continue our financial support of the Argentine nuclear plan and of its independent development. This is so because our thinking with respect to a country's independence in this field is very straightforward: We do not care to work with people who are not knowledgeable, because it is unprofitable to us; it does not benefit us in any way. What we need is a real partner; and this can be advantageous to both parties, not only presently but also in the future in view of possible exports.

We have connections with the entire world and we think we can penetrate new markets with Argentina as a partner in the development of other countries.

We must not forget that, in the nuclear sector, Argentina is more independent than Germany and can therefore enter some markets in which we would have more difficulties. Argentina, for its part, could have the benefit of our know-how and our industrial experience, to better meet the demands placed on it by a new market. In a word, I think we can complement each other very well.

[Pahissa Campa] What has just been said demonstrates once again the importance the development of the Argentine Nuclear Plan can have.

[Carella] With regard to new markets for our nuclear industry, I would like to point out that a meeting is taking place at this time in Lima that is being attended by AECL, KWU, FRAMATOME [Franco-American Atomic Construction Company] and other firms, and the purpose of which is to consider Latin America's nuclear development possibilities.

[Kunica] I would like to come back to something Martinez Favini said. I refer to a concept we might define as the beginning of the "antinuclear industry." This concept is making mounting headway in the United States and other countries in which nuclear matters are a more widespread topic, and I would like to see it addressed, if only briefly, at this table because I consider it highly important.

With respect to the comments made by Carella, I would like to mention that Dr Raul Boix Amat, who has gone to Lima to attend the seminar, left with me a copy of the paper he will present at the meeting, and asked me to mention at this round table some of the innovative concepts contained in that paper.

The paper is titled "Regional Cooperation for the Development of Medium-Power Reactors: Study Proposal" and is very extensive, of course, but the most important concepts are contained in a study it proposes be carried out, that would compile, in organic form, the data needed to draw up a Latin American nuclear power generating program with the required degree of integration to ensure, within a reasonable time, regional self-sufficiency in the use of this unsubstitutable energy resource.

In other words, the idea that will be launched is that of a program within the Latin American ambit, with the participation of the countries that are possessors of know-how, with the countries that can contribute technological methods, with professionals from countries of the region, and channeling all the experience that has been accumulated in the area throughout these past years.

[Robinson] I would like to add for your information that, also in Lima today, AECL is presenting a paper on the 300-MW [megawatt] Candu reactor. Even though work in Argentina is proceeding on the basis of 600-MW reactors, the possibility should not be discarded, here or in third countries, of building 300-MW reactors in cooperation with Argentina.

[Pahissa Campa] When we replied to the newspaper article I referred to a moment ago, we pointed out that not only should the state invest in this plan but that solutions of another kind can be sought, based on investment by business firms. Thus, the representatives of KWU and AECL being present here, and in view of the interest of both in joint operations with Argentina, I take this opportunity to propose the possibility of forming an association or alliance to help with the development of such an Argentine Nuclear Plan as would in some way result advantageous to the firms cooperating in it.

[Yriart] ...that could be interpreted as a "cartel!"

[Martinez Favini] I understand Pahissa Campa's concern and I don't think I am in any way proposing the formation of a "cartel." Perhaps the word "alliance" was a bit disquieting, but I believe the question is a high-level one and that, owing to its implications, perhaps it cannot be answered at this time by the distinguished representatives of the foreign companies seated with us here.

[Calvino] In any case, we can leave this for an after-luncheon chat, with the recorder turned off. I would like to return to a topic that has been termed secondary but which appears to me to be of the utmost importance. I have just been to the United States and seen the American nuclear industry in a state of prostration that defies description. And the impression I received was that one of the factors that was heavily instrumental in bringing about the present situation in that industry has been, specifically, the antinuclear propaganda campaign.

This is why I would like to know the opinion of some of the representatives of firms here, as to how they evaluate the possible impact of an antinuclear campaign in our country, in view of the fact that signs of such activity among us are already surfacing.

[Yriart] If I may, I would like to add one point that is part of the question and part of the answer. Towards the end of last year, Dr Alvin Weinberg, who currently heads a research group on long-term energy problems, presented, in Buenos Aires, the results of a study in which it was found that antinuclear activity tends to increase in tandem and commensurately with the opening up of political processes, and that, on the other hand, in countries that follow more authoritarian systems--and the case of France was cited as a very interesting example--these movements do not prosper, precisely because of the large degree of political centralization that prevails there. This is a point I wanted to bring up at this table, because we are in the midst of a transition in the political process, an opening up of the process, and this leads to the question of your views as to the effect this opening is likely to have on the antinuclear movement.

[Calvino] I am not familiar with the Weinberg study, but I believe it leads to a false premise in that it pits the idea of democracy against that of nuclear development.

[Pahissa Campa] The apparent prostration of the American nuclear industry is explainable from various standpoints. TIME magazine recently published an excellent article clarifying some aspects of the problem. On the one hand, in the United States there are many companies that are building power plants. By the same token, there are good companies and bad companies, and, since the construction of these plants is not being governed in the same manner in all cases, their safety limits are being found to be precisely... stretched to their limits.

This situation, of course, is facilitating the spread of the green wave and its assertion in that country.

On the other hand, some of the temporary paralysis in the building of power plants in the United States is explained by the waste those plants generate. Until a short time ago, not much attention was being paid to this aspect, the proof of this being that most of the waste from nuclear power plants has been stored, not processed. Now, a major portion of the effort in the

nuclear field there is being devoted to resolving that problem. Let me say that this is a problem not only in the United States but worldwide, and serious work is being done to find a solution to this important issue.

In this regard, it is worthy of note that our country has addressed this aspect very seriously from the start, so as to avoid any problems arising from that source.

[Yriart] It would be interesting to return to Calvino's question as to whether we perceive the advent of an antinuclear movement in Argentina. And I would add: What do you make of that action? and: What do you think must be done in the face of it?

[Fitte] I believe that a number of unfavorable views exist within the country on nuclear activity. I think this is owing principally to the pendulous nature of Argentine policy, and this is why I deem a definitive statement of policy by the Government in this regard to be highly important.

Let us bear in mind that, as it has been put here, the nuclear industry has not had strong protectionism on the part of the Government, but rather a participation in its development, which could be termed an "integrated approach." It follows that its defense must also be shared equally by the state sector as well as the private one.

I estimate, however, that antinuclear activity is still at a low level. It is in the hands of small scattered groups that do not represent a nationwide view to any extent whatever. On the other hand, a lack of definitiveness on the part of the Government, or a suspension of programmed work, could cause very serious harm to the sector.

[Martinez Favini] I think that in regard to antinuclear activity there are two types of attitude: On one hand, you have those who are emotively actuated and who therefore respond irrationally; but on the other hand, we must recognize that there are persons who are seriously concerned by this issue. Thus, it would be a grave mistake to believe that all those who demonstrate against nuclear energy are triggered by emotive springs or personal interests.

There are some highly responsible persons who are not in favor of nuclear energy and, in my opinion, we must respect their views. Let us remember, for example, Jorge Sabato's dictum in his time, namely, that "Producing nuclear energy is consorting with the Devil"; but having said that, he also acknowledged that while this consortion is difficult, it is indispensable.

Therefore, I think it important not to create antagonistic groups that will front their views. It appears to me much more constructive to exchange information, ideas and experiences, as this will be useful to all concerned.

[Kunica] Fitte's comments as amplified by Martinez Favini have put matters in their proper perspective and I would only add that the existence of con-

cern among the technicians, among the industrialists of the sector, and for this reason it is of fundamental importance to disseminate precise and reliable information serving to clarify those points that might otherwise remain obscure or lend themselves to erroneous interpretations. In a word: Information must be put forth to combat disinformation.

As regards continuing the Nuclear Plan, it is my opinion that the budgetary problems cannot be viewed as other than real stumbling blocks, since it is useless for the Government to give us assurances that the Plan will not be modified and that there is every intent to see it through, if at the same time we are confronted by insurmountable budgetary constraints that must perforce affect the continuation of projects.

It is important to point out, however, that there are business firms prepared to contribute to the continuity of the Plan. Thus, for the fourth power plant, there are concrete proposals for joint participation so that the studies will not be delayed.

Furthermore, there is a pending bill aimed at the promotion of industrial activity, that is not based on subsidization and that we hope to re-introduce, because included in that bill are concrete proposals for the reactivation of and joint participation in industry, its sole object being to stimulate development under the guidance--but not the protection--of the state.

[Carella] I share unreservedly the view that has been expressed here as to the need to give more open dissemination to all information connected with nuclear activity. Clearly, the extreme reserve with which such information has been treated has not been beneficial and has contributed to the forming of polarized groups of "nucleocrats" on the one hand and "ecolocrats" on the other.

I believe, as has been said here, that the most advisable thing would be for the interested parties to meet and discuss their viewpoints, because the issue warrants it. But the discussions should include as participants not only the officials of the CNEA and the industrialists of the sector, but also --in my opinion--representatives of the labor sector.

I have talked with members of this sector and they have told me of the existence of misgivings in regard to safety. Those misgivings warrant being addressed beyond the mere question as to whether or not they are well founded.

I further think that, from a legislative standpoint, there is a need for new ideas to be introduced to match the realities we are being compelled to live. In this regard, the PJ [Justicialist Party] will soon introduce a bill bearing exclusively on the peaceful use of nuclear energy. It stipulates that the statement of intent of the proposed law is to be communicated by the PEN

[National Executive Body] to the international bodies and to every country in the world. This would thus become a unilateral declaration and would have international validity under common international law.

After this must come the enactment of a law, which certainly would be introduced by the PEN, stipulating the objectives for the CNEA. In this regard, it is my view--my opinion in this regard must not be interpreted to be the position of the Justicialist bloc--that some basic points must be incorporated into that law. One of these should address our export policy. In this respect, it is my view that the future law must be specific as to the support the national government is to provide to the private sector and to the CNEA itself in their effort to penetrate the international market.

Another basic point to be incorporated is the one connected with reactors, namely, the type of reactors that is to be used in the future.

A third point would have to do with the consolidation of the fuel cycle. The provisions of the law on this point cannot, in my opinion, be subjected to budgetary limitations of any kind whatever.

Still another important aspect that must be dealt with explicitly is the one inherent in the farming-and-livestock and industrial applications of nuclear energy.

The safeguarding and protection of the environment would also be a point that must be addressed by the law, especially insofar as concerns the obligatoriness of compliance with safety standards, not only within the Commission but also outside it.

And lastly, I would add a point in regard to participation by the labor community and the industrial community in the management of projects and in the proceedings of the CNEA itself.

I think this would be the only way to control progressively the natural effervescence stemming from the country's democratic explosion. The problems are latent and to try to discard them would be a real mistake.

[Pahissa Campa] I concur that it would be beneficial to hold a round table with ecologists to address the positions of both parties.

I agree with such a proposal because anything that can give rise to interpretations capable of producing apprehensions or misgivings in public opinion needs to be clarified.

The case of the Windscale power plant, for example, is illustrative, because a higher percentage of cancer cases among children there is being claimed, but what is not being cited is the fact that this plant is considered the dirtiest reprocessing facility in the world. I would not be surprised, therefore, if what is being claimed is actually true.

This is why the population must be constantly and clearly informed, so that doubts and fears will not arise.

Those of us who are in the nuclear business know that two-thirds of the cost of a power plant goes into fail-safe systems; and this ratio exists in no other industry in the world.

The incremental cost of nuclear plants--which is another aspect that is criticized--is owing principally to the new safety measures.

There is a very amusing fact that merits comment. There is, in Manhattan, a conventional power plant housed in a building with an exterior granite facing. The level of the natural radiation emitted by this granite is higher than that produced by a nuclear power plant, but since it is a conventional plant it operates without objections.

This is why I feel it is necessary to provide the public with statistics compiled by the National Committee for Radiological Protection. A few years ago, the chairman of that committee, in a talk he gave to the AATN, stated that the nuclear industry was very substantially below many other industries from the standpoint of contamination. The mortality rate in the farming and livestock industry was exceptionally high, to say nothing of the rates in the case of coal mines and other activities involving a high risk for the worker or for the population around the industrial plants.

In view of all this, I would like to meet with the ecologists to see if they can show me proofs of what they are arguing, to make sure we industrialists are not maneuvered into becoming more redoubtable defenders of the ecology than the ecologists themselves.

[Calvino] Regarding what has been said about opening up the CNEA's doors a bit more, I would like to take advantage of the presence here of the chairman of the Board of Consultants to ask that he comment, inasmuch as the consultants have repeatedly voiced the difficulties they encounter in penetrating the nuclear sector.

[Buguna] The former chairman of our Board used to say that it is clear, from observation of the CNEA's proceedings throughout its existence to date, that the CNEA has put a sensible industrial promotion policy at the service of the Nuclear Plan. Nevertheless, the Argentine consultants community, which I would characterize as an important expression of our national intelligence, and which is, in its own right, the hub of an important sector of Argentine engineering, has traditionally been excluded by the CNEA from that policy that we have been upholding as being sensible promotion.

It is very clear that the CNEA has always reserved to itself the technical and technological aspects of the activity. This is perhaps not surprising, since that attitude reflects the Argentine governmental mentality that prevails in many other sectors, and perhaps this is why it becomes so difficult to effect an opening of doors to the independent national sectors.

One need not go very deeply, however, into a reading of the Argentine Nuclear Plan, or an analysis of its characteristics and projects, to perceive that the national consultants community could provide active participation in the plans, since it is qualified for that.

To summarize, I thank ENERGEIA for having given me this opportunity to comment on the uneasiness felt in this regard by our Board, which, in the final analysis, seeks nothing other than to contribute its share to our national development.

[Martinez Favini] Perhaps we must acknowledge that the CNEA has been somewhat self-centered; however, this has been a recourse adopted not so as to favor any one sector in particular, but rather in order to preserve a pluralistic community.

As for the specific issue of consultant services, let me assure you that it is not a matter of the Commission having traditionally done away with its use of local services of this type. We must bear in mind that the use of these services is often precluded by the legal system external to the Commission; this is aside from the austerity policies that have invariably governed the CNEA.

As for Carella's comments a moment ago regarding the restricting of information by the Commission, well, we have always tried to make available as much information as possible, but, as Dr Gonzalez Bergez once put it, "Broadcasting the news is not the same as offering information of parliamentary quality." Well, we have borne this concept in mind and today we are trying to offer information of a parliamentary quality, that is, substantively deeper and broader in content.

[Buguna] Since 1973 and to date, we have been being included in the austerity decrees that have been copied slavishly one from the other, conveying the impression that consultant services represent superfluous expenditures and not a value added to the major public project that is being undertaken.

[Gaspar] I should like to make a comment in connection with the possibility of participation by outside consultants (let me make clear that my participation in this round table is solely as an interested observer, since I am an independent professional). A point I would also like to make is the need to apply human resources to technological development, and in this regard to call attention to the changes that are taking place among various independent professionals, who have either joined some business sector, abandoning their independent practice as consultants, or in some cases abandoned the nuclear field, thus wasting the experience they have acquired in that domain.

While this is not the general case, it can be considered an observable phenomenon over the past 3 or 4 years.

[Bidone] Up to now we have hardly touched on the topic of the nuclear supply industry. To date, the nuclear industry has developed in a very uneven manner; however, large investments have been made which have not as yet netted a profit for the companies, and on which the companies have as yet no idea as to whether they will be profitable.

Thus, it is very important that the outlook for the Nuclear Plan be defined urgently; otherwise, new investments will be hard to come by. A certain mistrust is already evident among the industrialists who have already made investments, and this has put a damper on the development-mindedness of the businessmen.

The rules of the game must therefore be clearly laid down, because the businessman needs to know what he can look forward to and needs to specialize in a specific line, since a company cannot be expected to undertake the development of all the aspects that comprise a nuclear power plant.

For an industrialist to specialize, he also needs certain guarantees that he will be able to participate as a purveyor of the supplies in which he is specializing, provided and when--it goes without saying--he can meet all the CNEA's requirements. This aspect has not yet been addressed and we think it is fundamental from the standpoint of instilling confidence among the businessmen as to the nuclear development of the country and the opportunities it will offer.

[Fittel] This is true, because we are not fully developed here, nor do we have a backlog of activity such as would enable us to ride out a prolonged slump. If the Nuclear Plan were to stop here, the companies would irremediably go under.

[Bidone] We are presently asking ourselves what we will do with our human structure for the purveying of nuclear supplies if opportunities are not created for their employment.

[Pahissa Campa] Correct. And it follows that should it in fact be deemed necessary, for example, to build the four plants originally scheduled to be built within the 1997 timeframe but to shift their construction into a 2010 timeframe in order to better manage our budgetary resources, it would be a tremendous mistake, for it would definitely spell the end of our industry. This is why we are insisting that the basic objective of the Nuclear Plan must be to consolidate that industry.

[Bidone] And it should be added that if the construction of the plants covered by the present timetable is delayed, the cost will really be very high.

[Robinson] I have observed that even in Canada, which has a longer history of production of nuclear power plants than Argentina, we find it necessary to rationalize the components-supply industry serving the nuclear industry. Of course, that implies creating other safeguards so that the possessor

of a monopoly will not be free to do whatever he wants, without brakes or bounds. But it is possible, and practical, to introduce other forms of control to guarantee the rights of the users of the electric services that will result from operation of the plants and that are to be supplied in part by the possessor of the monopoly, as regards specified services. However, it is unavoidable, because the playing field in Canada is not large enough, and I doubt that it is any more so in Argentina, to enjoy the luxury of having two or more manufacturers of each component.

[Carella] I believe the traditional industrial-promotion laws have not proven to be the most effective for the promotion of industry, and I therefore consider it necessary to resort to other, more innovative, legislative mechanisms, and, in addition, to try to set up a schedule of contracts per program.

That is, for example: Through agreements, have the CNEA implement programs, be they for reactors, fuel cycles, etc, and sign 10- or 15-year contracts with the private sector, containing mutual quid pro quos, of course. This would virtually resolve the budgetary problem, since the state, through a contractual relation, commits itself to the development of a specific program.

And the compliance with these contracts could very well be overseen by the Parliament, to ensure that neither the private sector nor any other sector is privileged.

These contracts must involve the entire nuclear community, that is, firms, workers, professionals, industrialists, and those regions of the country where it is intended, to build a nuclear installation.

I believe this is the best way to promote the Argentine nuclear industry, inasmuch as all the traditional mechanisms could fail, as has happened on other occasions.

[Martinez Favini] I fully agree with Carella. The promotion laws are inadequate today for the development of a promotion policy. Policies, by definition, are made by the Executive Body, which is a formidable decision maker, whereas the Legislative body is not.

[Calvino] Regrettably, our time is up. As was to be expected, many topics have remained unaddressed, but they provide us a reason for a new get-together, very soon, and another luncheon. I thank you in behalf of ENERGEIA for your cooperation, and take this opportunity to remind you that our publication is at your disposal.

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YRIART WRITES ON DISAGREEMENTS OVER CNEA APPOINTMENT, BUDGET

Buenos Aires ENERGEIA in Spanish No 44, Mar 84 pp 1258-1259

[Article by Martin F. Yriart: "Nuclear Hot Line: Appointments, Confrontations and Scattered Thundershowers"]

[Text] The first few days of January 1984 demonstrated the need for Radicalism, once it had assumed power, to readjust to the reality of the Argentine nuclear vista. The nuclear hot line operated incessantly, ignoring the summer truce. To the issues on the front burner (foreign policy, Nuclear Plan, supervision of the CNEA [National Commission for Atomic Energy]) was added the ecologist offensive, which for the first time in this country has begun to take on significance.

Turning to institutional matters, and without awaiting enactment of the pending Organic Law of the CNEA, the PEN [National Executive Body] officially ended the transition and appointed the new chairman. The Caputo Commission, in its turn, after a few weeks of activity, reverted to a state of relative lethargy. The action front is no longer in the realm of foreign policy, as the Radicals initially thought it would be, but rather in that of energy investment planning and the national budget.

Appointment of Constantini

The most widely held assumption in December was that the Radical Government would hasten to submit its CNEA organic bill in special session, so as to immediately appoint the new chairman, and that Dr Renato Radicella would remain in that position during the interim, while the Caputo Commission exercised a de facto supervision over foreign policy. This procedure would, it was felt, enable the installing of a chairman whose hands would not be tied and who would not have been required to shoulder the exacerbating process inherent in presiding over the reorganization phase and the internal changes within the CNEA.

The appointment of Engineer Alberto Constantini, therefore, came as a surprise, nothing having been established as yet as to the future Argentine nuclear policy and the role of nuclear-generated electric power and its industrial sector within the country. Constantini was the chairman of the

Argentine Board of Engineers and head of a large construction firm bearing his name, at the time of his appointment, and his long career includes having served as minister of Public Works and Services under President Arturo Frondizi, and as rector of the University of Buenos Aires during Jorge Rafael Videla's presidency.

Constantini took office on 19 January. Politically, he comes from the Democratic Action movement, a belated conservative alliance that did not manage to run as a political party in the elections and that is headed by Dr Pablo Gonzalez Bergez (who is known also for his Masonic faith). Several members of the alliance are key figures in the CNEA, including lawyer Jorge Martinez Favini (manager of legal matters and conspicuous political adviser to Castro Madero during the latter's chairmanship).

Return of Castro Madero

During the first weeks of December, Castro Madero's career reached its lowest point, and it looked as if the country would divest itself of one of the key figures in its highly successful nuclear development, a divestment the luxury of which it could ill afford, considering that talented persons of the stature of the ex-chairman of the CNEA are not easily come by any day of the week.

However, after being subjected, in December, to a broadside of unsubstantiated accusations (disappearances among CNEA members, secret atom bomb plans, conspiracies to make of the CNEA a state within the state, etc), Castro Madero reemerged in January like a Phoenix out of its own ashes. On the 14th of this month, LA NACION dedicated a full page to him in a detailed and stout defense of the Nuclear Plan. Ten days before, the daily had editorialized on the topic, arguing in its favor as it has always done.

Five days following the appearance of the article, Constantini, upon taking office as chairman of the CNEA, announced that he had done so requesting simultaneously of Alfonsin that he appoint Castro Madero as adviser to the chairman.

Check to the Secretary

Conrado Storani, former gynecologist, and electoral strategist and confidant of Alfonsin, had come out in favor of retaining Castro Madero as chairman of the CNEA, prior to the elections, and this was interpreted as a stand in favor of the Nuclear Plan. But after being appointed secretary of energy, he appeared to completely reverse his stand, stating instead that nuclear energy would not be a priority and that the matter was within the exclusive area of responsibility of the president of the nation.

A confrontation with Constantini--a man of strong character, if ever there was one--was inevitable and led finally to intervention from on high, a thrust by Minister of Public Works Roque Carranza, and appointment of the latter also as a member of the Caputo Commission.

Finance's Turn Next

To carry out the implementation of its programs at normal pace in 1984, and to initiate others that are necessary for further progress along the line of advance it has maintained throughout the past 3 decades, the CNEA will require a budget of \$2.2 billion this year, and that is what it requested no sooner had the Secretariat of Finance asked the various governmental departments for a statement of their budgetary needs.

The CNEA's statement of its requirements bounced back with a directive requesting a reduction of expenditures that would be impossible to achieve. The fact is that, in 1983, despite its having slashed expenses to the bone and reduced the rate of construction work on Atucha 2 and Embalse by 50 percent (see ENERGEIA No 43, pp 1203-1204), the CNEA's budget neared \$1 billion, and at that rate the total paralyzation of its operations would be a matter of months, since according to the construction schedule, Atucha 2 and Arroyito have entered a phase in which the flow of funds must be increased considerably. In 1983, moreover, 50 percent of the CNEA's disbursements went for capital amortization and interest due on its debt, which will probably be the case again this year, inasmuch as the CNEA has \$1.4 billion of contracted debt, approximately \$500 million of which are short-term debt and a result of the budgetary policy inherited from Dr Juan Alemann.

It is Finance's turn now to cross swords with the CNEA. Several documents that were drawn up in the Secretariat and published over the last few weeks reveal a position as extreme as it is lacking in solid footings. Well-informed sources asserted, the second week in March, that Constantini had gone to meet with Alfonsín carrying his budget in one pocket and his resignation in the other. "I am not going down in history," he is reported to have said, "as the one who buried the Argentine Nuclear Plan."

... And Meanwhile, in Palacio San Martín...

Someone opened the window and out streaked the ghost of the CNEA's "armamentist" plans and state-within-the-state conspiracy, transformed into a swarm of moths, cobwebs and swept-up dust.

The extreme detachment the Radicals had shown as regards the significance of the position adopted by Argentina over the last several years with respect to international nuclear matters, and its strategy for defending our full and independent development and not renouncing our sovereignty, became, no sooner had they taken office, an ever-closer adherence to the policies that had been developed and a frank acknowledgement of the sense of responsibility and the adequacy with which the CNEA's operations had been conducted in the palace.

The decision to not sign the Nuclear Nonproliferation Treaty was confirmed by Foreign Minister Caputo, first in Buenos Aires to the accredited Diplomatic Corps, then in Geneva to the Disarmament Conference. The pre-electoral enthusiasm for a possible ratification of the Tlatelolco Treaty, and in its potential value as a bargaining chip with respect to our foreign debt and

the Malvinas situation, faded in the face of evidence that, under present conditions, ratification of the Tlatelolco Treaty was tantamount to having signed the Nuclear Nonproliferation Treaty, in that the safeguards agreement Argentina would have had to sign is different [as published] from what the Nonproliferation Treaty asserts and entails the same renunciations of sovereignty, constraints on development, and technological monopolies as the Nuclear Nonproliferation Treaty.

Pronuclears and Antinuclears

The nuclear energy polemic in our country, which intensified last year, became even hotter early this year. The antis are lining up in several camps, with more or less standard arguments.

Outstanding among the list of antis of the financial camp, one might single out as its figurehead the brand new national deputy, Engineer Alvaro Alsogaray (who included atomic energy among the Argentine maladies and causes of our foreign indebtedness. Alas, the poor uninformed man!). He was echoed in the "Letters" section of LA NACION by Jose Maria Gonzalez Eiras, out-and-out liberal, who in the same column was made to bite the dust by Rear Adm Fernando A. Milia, former head of CITEFA [Armed Forces Scientific and Research Center] and now executive vice-president of INTI [National Institute of Industrial Technology]. Another of the same camp was Dr Salvador Treber, adviser to the president of the Central Bank, who advocates Draconian budgetary slashes, but manipulates totally incorrect figures with respect to energy costs, investment totals and quantity and quality of our debt.

Into the arena there came also the antis of the ecologist camp, who wield the TTT's [Three Tremendous Terrors]. TTT No 1 is the nuclear holocaust (and we agree), the avoidance of which necessitates elimination of all uses of atomic energy throughout the world (which is demonstrably false). TTT No 2 is the inevitability that, because of the long half-life of fission products, these will end up threatening the subsistence of mankind for thousands of years hence (This is debatable and, in the final analysis, mathematically calculatable, but it is also a question of responsible management of the cycle). TTT No 3 is that nuclear power-generating plants, reprocessing plants, etc could explode at any moment, contaminating everything (as if the nuclear industry were possessed of a secret suicidal impulse).

Advocates of TTT No 1 these last few months have included: Miguel Grinberg (MUTANTIA, Natura), Jose Westerkamp (MOVYP [expansion unknown]), Juan Scroder (Tierralerta) and Jorge Di Paola Levin (EL PORTENO).

TTT No 2 was brandished by Antonio Battro (CONICET [National Council for Scientific and Technological Research]) and Florencio Escardo (eminent pediatrician), both in LA NACION.

TTT No 3 goes round and round the Ecology Shop of the Center for Political Participation of the Movement for Renewal and Change of the UCR [Radical Civic Union] whose voice lead is sung by Lawyer Alberto Kattan, noted for his highly successful campaigns in defense of porpoises, penguins and whales, and more recently for his suit brought successfully to proscribe the use of 2-4-5-T, the defoliant known as Agent Orange, used by the United States in Vietnam and which possesses known carcinogenic and teratogenic effects.

Very recently, rejoining the ranks of the pronuclears was a repentant deserter, the BUENOS AIRES HERALD, which carried in its pages a polemic in which the pros and antis participated throughout the summer. A March editorial confirmed the old BUENOS AIRES HERALD line, that of backing Argentine nuclear development within reasonable limits and capitalizing the major advances achieved.

Stop the Press

As we go to press with this dispatch, two unknowns remain: The CNEA's 1984 budget and the Organic Law the Caputo Commission is drawing up. We shall see what happens.

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ENERGY SECRETARY DRAWS CRITICISM FROM CNEA

Buenos Aires ENERGEIA in Spanish No 44, Mar 84 pp 1260-1261

[Article by Martin F. Yriart]: "Nuclear Power Plants: Are They as Costly as Storani Says?"

[Text] "Storani, referring to the Government's decision to tend toward austerity in all areas, stated that 'In energy we will be aiming at cost reductions,' and added that, to accomplish this, our natural resources will be used rationally 'in the following order of priority: electricity (sic), gas, coal, oil and, lastly, nuclear energy, which is the most costly (sic).'"

Thus were summarized by CLARIN in its 21 February edition the statements of the secretary of energy, Dr Conrado Storani, in which he set forth what in his judgement must be the order of priorities for the energy sector.

These statements inevitably aroused irritation within the CNEA [National Commission for Atomic Energy], whose figures flagrantly contradict the order of priorities indicated by the secretary. Indeed, the report on costs of electrical energy throughout the country, by sources, and as calculated by the Unified Services-Accounting Office, which is operated by the Water and Energy Company for the Secretariat of Energy, reveals that nuclear power has consistently been the country's cheapest source of energy to date.

The report footnotes the reasons for this finding, which indicate that this situation is likely to continue in the future and will tend to evolve more and more in favor of nuclear-generated electric energy.

Dr Storani's enumeration of our "natural resources" begins with "electricity." This boo-boo may well be the fault of the reporting newspaper, which may have swallowed the prefix "hydro-", in which case the secretary would be exonerated of blame and accountability. Or, it may stem from the prevailing concept that the generation of electricity is the most efficient form of conversion and application of energy from fuels, as opposed to the use of automotive energy by steam engines or internal combustion engines.

Subject to this proviso and using as a basis of comparison the cost of the electric energy produced within a representative group of power plants in

the public network (Chart 1), Atucha 1 led the rest as of the middle of last year, with a generating cost of \$22.40/Mwh [megawatt-hour]. It was followed by Hidronor, with \$23.13/Mwh; Salto Grande, \$29.92/Mwh; and Segba, \$31.58/Mwh. These costs include transmission costs, which in the case of Hidronor, it should be noted, represent 38.56 percent of the total cost.

It is important to note that the cost attributed to Segba contains serious distortions, in that the cost of fuel in the total figure given is put at only \$14.80/Mwh, owing to the fact that the fuel oil purchased by Segba is highly subsidized. If, on the other hand, Segba had to purchase it at the international price of \$170/ton, the fuel cost per Mwh generated would be \$41.98. With the plant operating at optimum efficiency, at a utilization factor of 63 percent, the final cost of the energy it produces would be \$51.10/Mwh.

By comparison, the generating cost at Embalse--which has not yet completed 1 year of operation at normal power--is \$37.80/Mwh, a figure that will gradually come down in the course of this year.

Putting aside now the present costs of production (regarding which it is well to note that, under the present system, the cost is identical with the price), and turning to the investment figures, nuclear energy again is found to be highly advantageous. A comparison on the basis of the ratio of investment to annual production capacity (Table 2) shows that Yacyreta has an annual investment cost of \$571 million per Gwh [gigawatt-hour] produced, whereas in the case of Atucha 2 this figure is only \$431 million.

The electric power generated by Yacyreta could be replaced by 3-and 1/2 plants having the capacity of Atucha 2, at a saving of \$2.45 billion in specific investment, plus the savings derived from not having to invest in transmission lines, since nuclear power plants are installed at the doorstep of their market. In our contry, unfortunately, hydroelectric energy--like gas, oil and coal--sources are located at the antipodes of their consumption centers.

As regards hydroelectric plants, this factor dissipates their intrinsic advantage of not requiring fuel for the generation of electricity, in that transmission costs (see Table 1) exceed, in most cases, the nuclear fuel cost per unit of energy generated. If we add to this the fact that, being more capital-intensive, hydroelectric plants entail proportionately higher financial costs, the advantage in favor of nuclear plants is evident.

A comparison in turn with conventional thermal plants shows to what extent the cost of fuel distances them from mean costs and places them at a competitive disadvantage. A survey made recently by the American magazine TIME, and published in its 13 February issue, reveals that, except in those countries where, because of pressure from ecologist groups or poor management of projects the investment costs of nuclear plants wildly overran projections, nuclear energy is tending gradually to increase its participation in the overall lineup of energy sources.

In our country, conventional sources are not exceptionally rich in reserves and the cost of exploiting them tends to be higher than the international level, whereas the nuclear source exhibits an efficiency that even exceeds international levels (short project-construction times, high availability factors, low power-generating cost, self-sufficiency of fuel supply, high degree of state participation in projects related thereto). It is reasonable, therefore, to think that nuclear energy merits a high priority, despite Dr Storani's statements.

Table 1

Electric Energy Production Costs in a Representative Group of Power Plants

1. Cost of Production and Transmission at Hidronor.

Basis of Calculation: Production of 5,191,900 Mwh annually.

<u>Item</u>	<u>U.S. \$/Mwh</u>
a. Production	14.21
b. Transmission	8.92
Total cost	<u>23.13</u>

2. Cost of Production at Salto Grande.

Basis of Calculation: Production of 4,926,100 Mwh annually.

a. Production and transmission	29.92
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3. Cost of Production at Segba.

Basis of Calculation: Production of 8,295,000 Mwh annually.

a. Fixed costs	16.78
b. Fuel cost	14.80
Total cost	<u>31.58</u>

Notes: a) The plant utilization factor at Segba, as of the date of these figures was 39.2 percent, owing to the priorities given to Hidronor, CNEA and Salto Grande. Fuel is calculated at domestic prices (coal, gas and fuel oil).

b) Based on a production level of 15,268,000 Mwh annually, a utilization factor of 62.9 percent, and consumption of fuel oil exclusively at the international price of \$170/ton:

[Continued next page]

Table 1 [cont'd]

Electric Energy Production Costs in a Representative Group of Power Plants

a. Fixed costs	9.12
b. Fuel cost	41.98
Total cost	<u>51.10</u>

4. Cost of Production at Atucha 1.

Basis of Calculation: Production of 2,607,000 Mwh annually.

a. Operation and maintenance	3.81
b. Capital costs	8.66
c. Taxes	0.58
Subtotal of fixed costs	<u>13.06</u>
d. Fuel	9.34
Total	<u>22.40</u>

Note: Operation and maintenance costs include wages, expendable supplies, services and D₂O losses. Capital costs include amortization of operating capital and an 8-percent return on the unamortized value of the plant: \$221.5 million.

5. Cost of Production at Segba.

Basis of Calculation: Production of 4,431,000 Mwh annually.

a. Operation and maintenance	3.32
b. Capital costs	29.19
c. Taxes	0.65
Subtotal of fixed costs	<u>33.16</u>
d. Fuel	4.64
Total cost of production	<u>37.80</u>

Note: Operating costs calculated as in 4. above; total plant investment to be amortized: \$1,400 million.

Table 2

Total Investments and Production Capacities of Atucha 2 and Yacyreta

<u>Item</u>	<u>Yacyreta</u>	<u>Atucha 1</u>	<u>Embalsa</u>	<u>Atucha 2</u>
Total investment (in U.S. \$ million)	10,000	250	1,400	2,200
Net energy produced (in Gwh per year)	17.5	2.5	4.4	5.1
Total investment per unit of energy produced (in U.S. \$ million per Gwh/year)	571	100	340	431

Note: Total investments for Yacyreta and Atucha 2 are those made public by secretary of energy, Dr Conrado Storani. Those for Embalse and Atucha 1 are taken from the CNEA's annual reports.

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BOIX AMAT PRESENTS PROPOSAL FOR REGIONAL COOPERATION

Buenos Aires ENERGEIA in Spanish No 44, Mar 84 pp 1268-1271

[Article: "Regional Cooperation for Development of Medium-Power Reactors: Study Proposal]

[Text] During the first few days in March, a symposium was held in Lima, Peru, on low- and medium-power reactors, in which the possibilities of nuclear cooperation among the Latin American countries were explored. From among the many proposals presented there, we reproduce below that of Dr Raul Boix Amat, president of FANAL [Federation of Latin American Nuclear Associations].

Introduction

The topic of regional cooperation for the development of medium-power reactors has been addressed heretofore from various angles, and has given rise to exchanges and concurrences of views in different Latin American forums.

Nevertheless, the need persists for a systematic study that will yield sufficient criteria for the planning of investments in this domain.

This paper develops several personal viewpoints as to aspects of the problem that need to be analyzed in depth with the object of arriving at a unified approach by the countries of the region. In addition, and with the purpose in mind of reaching the necessary convergence of viewpoints, it describes possible objectives and the scope of a study that, if carried out jointly, would open the way for agreements and concrete realizations in this domain.

General Aspects

Generally speaking, the development of Latin America's capability to design and build nuclear power plants is in its incipient stage. The three nuclear power plants in operation as well as those in advanced stages of design and under construction, were contracted out to firms outside the region.

Although participation by local industry and engineering in these projects has grown, there is still no indication that the design capacity exists in this region such as would be required, for example, to develop a prototype for a nuclear power plant that would best satisfy needs that are common to the region, without resorting to extensive technological dependency outside the region.

In my opinion, if this capacity has not yet been explicitly demonstrated, it is because, despite the manifest integrationist predisposition of the Latin American countries, the rivalries among neighbors that have prevailed in the region for so long have nurtured competition and starved regional cooperation in this field.

The incredible separateness that exists today among the three nuclear power plant programs that are under way in the region may very well have had its origin in these rivalries.

Happily, there are indications that this historic trend is tending to reverse itself rapidly, and this is owing in part to the experience that has been acquired, and in part to the force of circumstances.

The experience accumulated by the countries of the region that have advanced the most in this domain demonstrates clearly that, to avoid "technological neocolonialism," it is necessary to acquire the design capability and the mastery of the technology these realizations require. This is a truly difficult objective to attain if one does not take an active part in and bear a responsibility for the design activities and the development of the technology. Regrettably, this experience also indicates that, for the attainment of these objectives, one cannot expect spontaneous and unconditional extraregional cooperation.

But beyond any possible doubt, the most important of the results stemming from this experience is the unqualified demonstration that, faced by the need and by the impossibility of obtaining outside help, the Latin Americans have been able to develop and completely master some of the most inaccessible technologies for the peaceful use of nuclear energy.

It is undeniable that the accomplishments achieved in this field have given new vitality to our confidence in the region's own capabilities, and this, added to several highly successful experiences in the horizontal transfer of technology, opens auspicious possibilities for regional cooperation in the nuclear field.

The pressure of circumstances, as I have pointed out above, has also operated in the same sense. The heavy indebtedness our countries have contracted with those countries that are in a position to sell us nuclear power plants, the difficult economic situation we are traversing as a consequence of our trade relations with those countries, the limitations being imposed on long-term investments as a precondition for the renegotiation of debts, our

endemic scarcity of capital resources, and the high price of the technology supplied to us have all compelled the substantial reduction in the nuclear power plant programs of some countries, and the delaying or postponing of them in others. And all this despite the certainty that nuclear power plants, during the next century, will be the backbone of the electrical systems of most of the countries of this region.

Thus, the force of circumstances also provide an impetus to regional cooperation for the development and construction of nuclear power plants.

We Latin Americans are convinced of the need to master these technologies, we have experienced the difficulties of achieving this mastery through extraregional assistance, we have demonstrated our own ability to achieve results in this field. If to this we add the fact that our hourly costs for engineering and the development of technology are substantially lower than in the countries that can sell us nuclear power plants, even in spite of our alleged inefficiency, the only factor that operates against us is the time that may be required to obtain results with our regional resources; and it is precisely because of the shortage of time that we must embark immediately on the regional cooperation approach.

I think the time has come for the community of professionals and technicians of the region who are dedicated to the nuclear sphere of activity to begin an in-depth analysis of these considerations, in organized fashion.

To that effect, I would like to discuss in very general terms the salient aspects of an initiative that has emerged within the recently created FANAL. This initiative had its origin in the proposal submitted by the president of the IPEN [expansion unknown], General Barreda Delgado, in the meeting of atomic energy authorities of the region held in Buenos Aires on the occasion of the inauguration of the second Argentine nuclear power plant.

Purpose of the Study

The study it is proposed to carry out would compile and/or generate, in organized form, the data necessary to draw up a Latin American nuclear-fueled electric power generation program, with the degree of integration required to ensure regional self-sufficiency, within a reasonable period of time, in the use of this unsubstitutable energy resource.

FANAL hopes that the conclusions and findings of the study will reflect agreed compatibilities among the technical views held by the experts of the region, and, in turn, give expression to the most sensible approach to merging local interests in this domain.

This will make it possible for the governments of Latin America to adopt the recommendations of the study for their national programs and, moreover, to orient their public and private investment plans in this domain.

Regarding Definition of Scope of the Study

Attainment of local self-sufficiency in the use of the nuclear energy resource for peaceful purposes has been and is a legitimate aspiration of all the countries of the region, because experience has demonstrated that this is the way to achieve the self-determination we need in the use of these resources.

It is well to point out here that joint participation in the development and governing of multilateral installations ensures for the countries involved the preservation of their interests and their technological independence, so that these joint projects also constitute for the region an adequate way to avoid technological neocolonialism.

Therefore, and on the assumption that the study is to cover not only nuclear power plants but also the installations required to produce their raw materials and process their waste products, the first question it must address is that of determining which of these installations can be designed to satisfy the common demand and, as a result, be made joint projects.

Obviously, as long as the degree of integration of the electrical energy distribution networks is not increased, the construction and operation of nuclear power plants will be under the individual responsibility of each country. Nevertheless, the design and the technology required to build them can very advantageously be undertaken as joint projects.

Similarly, the design, construction and operation of some of the installations of the fuel cycle can also be joint undertakings.

I have pointed out on other occasions that the multinational nature of the sensitive installations of the fuel cycle provides a real guarantee of non-proliferation, offers major economic advantages, and makes available the possibility that even those countries in the region that have limited capabilities for undertaking national projects in this domain can nevertheless be assured of having the services derivable therefrom.

A classification of installations as being of individual or joint nature becomes necessary as a first approximation, with no constraints on the modifications it may undergo as the study progresses. This classification must also be extended to the manner in which the different phases of the project are to be undertaken.

The second problem the study must address is the quantification of the expected regional demand. In this regard we can say that quite a lot has been done in the various countries. However, if we consider that the conclusions to be drawn by the study are to be valid throughout the period required to attain regional self-sufficiency, the estimate of the demand must cover almost a quarter-century, and this is not easy to arrive at in all the countries involved.

Fortunately, the countries that do not have reliable statistics are also the countries whose demand growth is likely to materialize over the longer term.

Also necessary will be an inventory of the available human and technological resources, and of the already-installed industrial capacity, prior to undertaking what I consider the most difficult phase of the study, namely: The analysis of technological alternatives.

In this phase, it will be necessary to preserve the objectivity that must characterize this type of analysis, in order to achieve a sound convergence of views.

Lastly, the joint projects must be analyzed in the depth characteristic of investment studies.

I have mentioned exclusively the areas of basic results of the study. Each of the area headings mentioned will, of course, have to be broken out into numerous subheadings and concomitant problems to be analyzed.

Thus, the study becomes a formidable challenge, the difficulties of which we have not underestimated. We are cognizant, however, of its necessity and its importance, and we are certain that the necessary capability exists in the region to carry it out.

We have already made a few very preliminary estimates as to the volume of work involved, with the sole object of gaining some idea of the organization needed to carry out the study, and although it may not seem proper to cite such very preliminary figures, I think it will be of some value to do so, if only as evidence of the intent of this proposal to achieve the widest possible regional participation in this undertaking.

Regarding the Organization Needed to Carry Out the Study

On a very preliminary basis, it has been estimated that the basic nucleus of the organization required for this study would consist of an average force of approximately 20 senior specialists backed by 50 professionals and the indispensable administrative personnel. This nucleus would operate in a close-knit manner and would rely on the collaboration of working groups distributed among the various countries. The study would require close to 1 million man-hours and could be completed within a period of 4 years, bearing in mind that much of the first year would be taken up in establishing the mentioned organization. The cost of the study has been estimated at around \$20 million, around 80 percent of which would be expenditures for personnel. It is hoped, however, that much of this expense would be absorbed by various public and private entities able to make the needed professionals available on an honorary basis.

Although FANAL proposes giving top priority to the use of regional entities, it does not exclude assistance and participation by entities outside the region, provided and to the extent they are unitary with the objectives of the study.

Lastly, I would like to point out that FANAL is a regional nonprofit organization that brings together the nuclear technology associations of the countries of the region. At the present time, since such associations currently exist in only five of these countries, the Federation must be considered an entity in the process of formation, with a regional representativeness that for the moment is only partial.

It follows that the sphere of applicability of this study exceeds FANAL's sphere of representation. Consequently, the intent to achieve the widest possible regional participation poses the immediate task of inducing the organic participation of many other entities interested in this proposal. Of course, it is totally open and, since it could not be otherwise, participation is voluntary.

Conclusion

I have tried to describe an initiative I consider to be of vast importance for the future nuclear development of the region.

I must apologize for discussing these ideas at their most primitive stage of gestation, but be it in my defense that my intent has been to stimulate the constructive criticism and the priceless comments from my listeners that will, beyond any doubt in my mind, contribute to the perfecting of those ideas. Therefore, in conclusion, I wish to state that I have merely attempted to point out one direction for embarking on the road to an effective regional integration and complementarity in the nuclear domain. And I have done this because I am firmly convinced that this road will lead to the peace and well-being of our peoples and the realization of the dreams of our founding fathers.

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BRIEFS

COSTANTINI ON CNEA'S FUTURE--Cordoba--The chairman of the National Commission for Atomic Energy [CNEA], engineer Alberto Costantini, claimed: "There is no oversizing of the nuclear development plans in Argentina." Costantini remarked: "CNEA is a model that should be imitated in other areas, because of what it has meant to the country's development." He noted: "Our country has made major progress in the area of applications in the nuclear field, particularly in medicine and industrial technology." He also claimed the role reserved for the CNEA in the energy field commenting that, "The reserves of other energy sources that Argentina has are limited; after the year 2000, it will become the leading alternative." Costantini also said: "The management of nuclear technology is essential for any country that wants to develop." The official avoided making any comment on the Argentine position on the Nuclear Non-Proliferation Treaty, indicating that, "This is an issue on which the Foreign Ministry has exclusive authority." Costantini made statements upon arriving in Cordoba last night, enroute to Embalse, where (as he disclosed) he will analyze "areas relating to the safety conditions offered by the nuclear power-plant constructed there. In response to a reporter's question in connection with the disclosures about the disappearance of nuclear physicists during the administration of Vice Adm Carlos Castro Madero, he said: "I have been unable to conduct any kind of investigation"; adding: "I heard something, made some inquiries and reached the conclusion that there was no type of persecution within the commission." Yesterday, he was received at a meeting by the governor of the province, who requested of him an increase in the royalty that the commission pays to Cordoba (currently, 1.4 billion pesos) for the use of the uranium mine at Los Gigantes, basing the request on several infrastructural projects that the province supports to ensure the utilization of the ore.

[Text] [Buenos Aires LA NACION in Spanish 10 Jun 84 Sec 3 p 2] 2909

CSO: 5100/2115

SCIENTIST ON ENERGY CONSUMPTION, NUCLEAR FUTURE

Sao Paulo TENDENCIA in Portuguese Mar 84 pp 40-42

[Antonio Costa Filho interview with scientist Jose Goldemberg]

[Text] Brazil should initiate a campaign for revision of the nonproliferation treaty with a view to guaranteeing not only the production of weapons but also access to nuclear technology.

The increase of hydroelectric energy consumption in Brazil, envisaged to be 7 percent this year over the same period in 1983, does not mean industrial and commercial growth as it did in the fifties and sixties. As explained by scientist Jose Goldemberg, president of the Sao Paulo energy complex that includes the Sao Paulo Energy Company (CESP), the Sao Paulo Power and Light Company (CPFL) and finally, Sao Paulo Electricity ELETROPAULO, that increase represents the effort of the energy companies in the campaign to substitute electric energy for oil derivatives, in addition to the hydroelectric demands of the population caused by natural growth.

In energy substitution, CESP alone guaranteed a savings of 15,000 barrels of oil a day. Even with encouraging performances, the Brazilian Electric Power Stations Corporation (ELETROBRAS) system, coordinator of the federal electric policy, accounts for about \$20 billion of the total foreign debt. Following that example of what the country has been doing, the thing has been to roll over the debt. How long that situation will last not even Goldemberg knows. In this interview, he comments appropriately on the dangers of an atomic conflict and the devastation of the nuclear winter, the contributions of Brazilian scientists to uranium enrichment, the Argentine bomb, the nonproliferation treaty and the efforts of Pope John Paul II for world peace.

[Question] On 29 February of this year, the Angra-I unit operated at its maximum capacity. Does that operation change your concept of the Brazilian Nuclear Program?

[Answer] Since 1980 that program has been outside of the national reality, bringing memories of other programs begun in the governments of Presidents Geisel and Medici which ended up falling into a vacuum outside of the context of national concerns. The Transamazonian Highway, for example, time itself

took care of showing that it was a mistaken project. The nuclear program formulated in 1975 and regarded as national salvation for the energy crisis of 1973 entered the same category of mistakes. Our problem was not the lack of electricity but of the substitution of energy derived from oil, which ended up not having a solution by that route because we produce more electricity. We have a hydroelectric potential capable of taking care of the country's needs up to the year 2010.

Transfer of Technology

[Question] The implementation of that program occurred at a time of easy and abundant funds. The country entered a nuclear phase prematurely, passing over priorities in the social area.

[Answer] Everything that pertains to the nuclear program was set into the Brazilian context in a completely artificial manner, meriting the joking but very good description that in bringing nuclear energy, President Geisel did not care about a solution but about a new problem. Besides being outside of the reality of the time, it was based on a dubious concept of the transfer of technology and ended up practically without success.

[Question] Did the dubiousness pertain to the validity of bringing a program here that was finalized outside without the slightest knowledge of Brazilian scientists?

[Answer] Exactly. Germany intended to transfer technological knowledge without real absorption by the Brazilians. In reality, if the government had had a little more acumen in 1975 it would have understood the criticism of many scientists, which was eminently constructive, as time took care of showing. Thus what remained of the nuclear program was the Angra-I reactor, which precedes the agreement with Germany. It is a reactor purchased on a turnkey basis which began to be negotiated in 1968 and only entered into operation in 1984, 15 years later. A very long time, responsible for part of the problems of Angra-I. And like a bridge that takes too long to be completed, at the time of operation infiltrations and other things appear.

[Question] You say that "time took care of proving" the contrary about the program but could it also take care of proving the efficiency of Brazilian scientists in that sector?

[Answer] Probably, but the time that was lost has really been lost. Today, the situation of the agreement negotiated with Germany is on the following footing: the first reactor that should have been ready between this year and the next is in the beginning of construction. And there is nothing of Angra-III. So the Brazilian dream that eight nuclear reactors would be operating by 1990 is shattered. Now, what will probably happen is that we will have two reactors of the German program operating between 1995 and 2000. The advantage of that is that it gives time for national industry and scientists to participate in the process through what has been called a parallel nuclear program administered by the National Nuclear Energy Commission (CNEN). Various attempts are underway to obtain uranium enrichment

not only by the German method but by others that involve the work of Brazilian scientists. These methods are by centrifugation and by laser, and the former will be easier to master than the latter.

[Question] Did the report that Argentina potentially is in a position to produce its nuclear bomb in a shorter period of time than Brazil arouse some type of concern among the three Brazilian groups charged with the nuclear area: the Brazilian Nuclear Corporation (NUCLEBRAS) linked to the Foreign Ministry and the intelligence community; the CNEN, linked to the navy; and the Aerospace Technical Center, connected with the Air Ministry; or did that not occur?

Feeling is One of Collaboration

[Answer] I believe that the concern in military circles was less intense than I had expected. To me that is a sign of maturity because the mastery of nuclear weapons is one of the ingredients of an aggressive policy. The time is past when the Brazilian military thought that if Argentina developed nuclear weapons and Brazil did not, it would mean the domination of Latin America by the Argentinians. That is not correct. Instead of an atmosphere of hysteria, there emerged the feeling that Brazil and Argentina should maintain collaboration in the nuclear area; this way another focal point of the nuclear arms race is avoided. I am in favor of that closer collaboration which would dispel suspicions and would permit Latin America to become an area free of nuclear weapons. Collaboration of this nature is more effective than the treaty that prevents the introduction of nuclear weapons into Latin America, impeding the arms race.

[Question] Is Brazil in a position to build its atomic bomb in a short time?

[Answer] I do not believe the country can aspire to build nuclear weapons in less than 10 years. It probably should not build them even within 10 years but if it did decide to do so, I believe it would be very difficult.

[Question] So why the reluctance to sign the treaty on the nonproliferation of those weapons?

The Radioactivity of the Holocaust

[Answer] It is because at the same time that it prevents the production of nuclear weapons, the treaty also prevents mastery of the technology for peaceful purposes. In signing such a treaty, the country would relinquish both things, dooming itself to not mastering nuclear technology and remaining in a position of a second-class power from the technological point of view. That is the problem and the position I have supported is that it is the nonproliferation treaty that must be revised. And despite being strongly pressured by the United States to sign the document, Brazil should initiate a campaign for its revision.

[Question] Now, speaking of the CESP, could you tell us how the company's hydroelectric production in the state is going?

[Answer] The Brazilian system for the sector is interlinked so that despite the fact that the CESP is a great generator, at the present time it is producing only 90 percent of the state's needs, importing 10 percent from Furnas. As time goes by, that situation will tend to lead the CESP to buying more energy since the state's hydroelectric resources are almost exhausted. Currently we are building four plants that will add about 4 million kilowatts to the 10 million already produced by the Sao Paulo system.

[Question] Will that guarantee the selfsufficiency of CESP or not yet?

[Answer] It would be enough to get us to 1987 or 1988 but after that we would need to import from Itaipu, in any case, since we are obliged to do that. So that measure excludes the possibility of autonomy of all Brazilian states in hydroelectric production.

[Question] The showing of "The Day After" caused a sensation of terror by depicting the nuclear horrors. In your opinion, does the film have a plot close to the real thing or is it on the level of fiction?

[Answer] The film pictures in a quite precise manner the immediate effects of a nuclear explosion: total destruction of the regions hit by the bombs; the radioactivity of the earth and atmosphere causing leukemia and other diseases, also of exposure. The film does not show the climatic disturbance resulting from the nuclear explosion as confirmed by studies concluded in 1939. That effect is also devastating, even more than the radioactivity.

[Question] What is that effect?

[Answer] The earth will be enveloped by a layer of atomic smoke and dust which will prevent the sun from reaching the surface. The temperatures then will drop from 40 to 50 degrees Centigrade. Thus, the tropical forests, for example, would be destroyed as would the Parana coffee plantations and decimated by a 5 degree Centigrade frost.

[Question] Was it that information that led the pope to convene a conference last January? What feeling prevailed among the scientists present at the Vatican?

[Answer] Learning about that, Pope John Paul II convened important world scientists to discuss the subject. The prevailing feeling, after learning that millions of deaths would be caused by the direct effect of being hit by the bomb, additional hundreds of millions of deaths would occur due to the climatic inversion described by the term nuclear winter; even if those countries were outside the range of the direct destruction of the bombs.

Instrument of Conquest

[Question] Would that unleash pressure against the countries that have nuclear weapons by countries that do not possess them?

[Answer] Yes. I believe that the interest in avoiding a war of that proportion does not pertain only to the countries that have bombs but to those threatened, which number more than 150. With the exception of five countries that possess significant weapons--the United States, the Soviet Union, France, Britain and China--the others are potential victims.

[Question] The argument that world war serves as a device for restructuring capitalism submerged in crises, owing to the reconstruction effort that would be unleashed later--can it not be used these days, since the earth would be destroyed around 20 times just as it has already been in the past?

[Answer] Not at all. The new element of the nuclear winter proves that a war has ceased to be an instrument of conquest but is subject to interests of all types. A nuclear war would end in mutual destruction between the vanquished and the victor. That was very well put by the pope, who is opposed to the use of nuclear weapons, because war no longer serves a political purpose since it is nothing but total destruction.

Rolling Over the Debts

[Question] You said previously that there is no crisis of hydroelectric energy consumption, so what kind of difficulty is affecting the sector nowadays?

[Answer] The large electric power companies do not have a consumption crisis because they are selling more, the problems arise over foreign exchange difficulties. The whole sector is heavily indebted today, estimated at about one-fifth of the Brazilian foreign debt, that is, the electric energy companies owe some \$20 billion. All that money--in some cases it was contracted because of incorrect evaluations of the country's every situation; in other cases, it was the only way Brazil could get dollars.

[Question] What is the situation of CESP's finances within that context?

[Answer] The situation of the Sao Paulo state power companies would be magnificent if it were not for the foreign indebtedness into which they were induced. That alone consumes approximately 40 percent of revenues. The other 60 percent is divided into reinvestments of the operation itself, fixed cost. They were induced to assume that indebtedness of about \$3 billion in the previous administration and as we solve that problem through rolling over the debt we will be in a situation to provide better service.

[Question] Can that rollover be maintained very long?

[Answer] How should I know. What we really need is a mini-moratorium.

8711

CSO: 8142/1523

INDIA

BRIEFS

NEW ATOMIC REACTOR--India will enter the third phase of its nuclear power program with the commissioning of the second fast breeder reactor at Kalpakkam near Madra by the end of this year. The chairman of the Atomic Energy Commission, Dr Raja Ramanna, told a meeting in Bangalore that all the major components of this reactor have been designed indigenously. He said the mixture of carbide fuel, made of plutonium carbide and uranium carbide, will be used for the first time in the world by India. Mr Ramanna said India has been able to achieve self-sufficiency in the area of nuclear fuel. [Text] [BK030337 Delhi Domestic Service in English 0240 GMT 3 Jul 84]

CSO: 5100/4734

PRC TO ACCEPT WASTE OF ZWENTENDORF POWER PLANT

AU021657 Vienna NEUE KRONEN ZEITUNG in German 1 Jul 84 p 2

[Report by Dieter Kindermann]

[Excerpt] Vienna--Following his return from Beijing where he recently held talks on the storage of nuclear waste in the Gobi Desert, Austrian Federal Power Company Director General Fremuth has remained silent. The Vienna weekly PROFIL has now revealed that during this visit a six-point memorandum on the PRC's accepting the nuclear waste of Zwentendorf power plant has been signed with the Chinese nuclear energy company, China Nuclear Energy Industrial Corporation [CNEIC]. Juridically, the memorandum is only a declaration of intent which can become an agreement only if two prerequisites are fulfilled: The Austrian law banning nuclear power production in Austria would have to be abolished with a two-thirds majority in parliament, and another referendum would have to be held in favor of putting the Zwentendorf power plant into operation. Politically, the arrangement with the Chinese should be more important, since it will enable the supporters of Zwentendorf, such as Austrian Trade Union Federation Chairman Benya, to argue that now the prerequisites for putting the 8 billion schilling power plant into operation--regarding safety and final nuclear waste storage--are fulfilled. And here are the main points of the memorandum now published by PROFIL:

--The CNEIC nuclear energy company is ready to accept from us 22 tons of nuclear waste annually until the year 2010 and to bury it in the Gobi Desert--in this context one has to know that experts have calculated an operational lifespan of 20 years for Zwentendorf.

--The Austrian Tullnerfeld power plant company in turn has committed itself to buy in the future enriched uranium or fuel elements only from the PRC. Here some difficulties might arise owing to the fact that the 499 fuel rods now at Zwentendorf have been enriched in the United States. Should the United States not consent to the burned out fuel rods ending up in the PRC, these fuel rods would have to be sold, and new ones would have to be ordered from the PRC.

--The memorandum expressly states that the burned out fuel elements and the nuclear material recovered from them must only be used for peaceful purposes and not perhaps for a nuclear bomb.

CSO: 5100/2575

ENERGY IMPACT OF TRILLO, VANDELLOS, ROBLA, COFRENTES PLANTS

Madrid LUZ Y FUERZA in Spanish Mar-Apr 84 pp 13-16, 19, 21-22, 25-28, 37, 39-40, 43-44

[Article by Jose Pons Correa]

[Text] Trillo I, Something More Than a Powerplant

On 28 March of this year, when the Council of Ministers decided to approve the new version of the PEN [National Energy Plan], a group of unknown factors that had for some months been affecting not only the energy sector, and, more specifically, the electrical subsector, but also the prospects for development in those areas wherein construction had already begun or it had been decided to locate an energy facility, were dispelled. The latter aspect is often overlooked or at least put off, amid the sea of kilowatt hours and high-level energy policy, but it does not fail to have its tragedy when one considers work stoppages and the detrimental effects that it can bring to those areas. Fortunately, the ratification of the Trillo I Powerplant, in the very heart of Alcarria Alta, will ensure the continuity of the economic takeoff process in its entire sphere of influence, which began the the very time that the project started. This process might have been more complete if the second nuclear group called for there had not been postponed.

A Powerplant in Alcarria

The Trillo I Powerplant is situated at the Trillo municipal terminal in Guadalajara Province, on the site known as "Cerrillo Alto," downstream of the Tagus River, just before the latter expands into the Entrepenas marsh. Its location in Alcarria is not coincidental, but rather the result of a detailed study made at the time, in which conditioning factors of an economic and technical nature were combined and harmonized. The proximity of the area to major power consuming centers, primarily Madrid and the industrial estates of Guadalajara and Alcala de Henares, as well as the advantages from a hydrological standpoint offered by its proximity to the Tagus River, with a guaranteed volume of flow of great size in comparison with the other river channels in the vicinity, constituted a first lineup of good reasons in favor of the site eventually selected. The geological and seismic studies confirmed the suitability of the location. It should not be forgotten that, as has been acknowledged

unanimously, the siting of the Trillo I Powerplant is exceptional from the standpoint of earthquakes, since it is located in one of the areas of the country with the least seismic activity, which is therefore more geologically stable.

And what about the human environment? Until the time that the Trillo Powerplant project started, Alcarria Alta had been subjected to a process of abandonment and depopulation, resulting from the lack of opportunities and a massive emigration, mainly to Madrid and Catalonia. During the 20 years prior to the start of the first work on the project, the municipalities of the area (Brihuega, Cifuentes, Sacedon and Trillo) witnessed a drastic decline in the numbers of their inhabitants, aging of the population, shrinkage of the economic climate and lack of social services and minimal equipment, embarking upon a cumulative vicious circle difficult to break.

Curb on Depopulation

It has been precisely in the breaking of this inertia that the Trillo project has intervened. Obviously, a project of its scope, with an investment exceeding 200 billion pesetas and huge labor requirements, could not leave the area unchanged. A mere visual inspection of the district enables one to realize that something has changed. Anyone who visited those towns 10 years ago and who does so now can notice a dynamism that did not exist previously.

The figures are telling, and afford the dispelling of any suspicion of subjectivism. In the table which follows, there are included a group of indicators on the four municipalities which speak for themselves. Between 1976, the date on which the prior authorization was granted and the first work began, and 1983, the area's population increased 16.6 percent, an increment that is in itself important, but that assumes particular significance when one considers the fact that up until a few years ago there had been sizable amounts of emigration. The number of commercial permits rose from 191 to 315, with a 64.9 percent increase; the number of trucks increased from 179 to 216; the number of telephones has virtually doubled; and the number of banking and savings institutions increased from eight to 14 during the same years. There are some who argue that economic growth does not always entail a heightening of prosperity; but what does not seem proper is to gage the degree of underdevelopment in an area in terms of depopulation, lack of equipment and business, etc., not acknowledging the improvement in those same indicators as a recovery of prosperity levels. In this regard, the mayor of Cifuentes, Quitin-Pedro Palafox, is categorical: "I don't mind expressing approval of the nuclear powerplants and opposition to the so-called 'parones' [stoppages]. In the past, the people here viewed the construction of a nuclear powerplant with suspicion, but now they are satisfied. The level of the people's income has risen greatly."

Recovery of the Economic Tone

The effect of the Trillo Powerplant on the recovery of the area's economic tone has occurred essentially in four ways: the settling of the population, the enormous wage volume of the project personnel with all its spending potential, the contracts with local business firms and the new tax revenue that the project has represented for the town halls. The type of impetus received may possibly serve to demarcate the models of takeoff within the area.

In the first place, there is the municipality of Trillo itself which, without having received a major population contribution, has had its town hall benefited from the receipt of the pertinent work permits, taxes and contributions; and, in the future, it will benefit from the permits for fiscal openings and urban contributions accrued by the powerplant. This special circumstance has made possible a decisive policy for improvements within the town, that has afforded the undertaking of projects long desired. The mayor of Trillo, Jose Luis Garcia Sancho, reports: "The money received by Trillo for the powerplant's licenses and permits may be estimated at about 120 million pesetas; but this money alone is no longer what is important, rather the multiplying effect that it has through agreements with the provincial deputyship in which we have a proportion of 40 percent, which enables us to carry out more expensive projects." In recent years, the town of Trillo has been able to channel and arrange both banks of the Tagus River passing through the municipality, to pave and to take running water to all sections of the town, to build a completely new town hall, to restore the roof of the parish church and also to build a multi-sports stadium of the kind that does not exist anywhere else in the district. Moreover, the settlement of the powerplant's future personnel in the municipality of Trillo has served to give a considerable impetus to the local construction sector, with a housing supply that has grown from 500 to over 750 during the past few years. Included among these accomplishments is a 48-dwelling village for technicians and the powerplant's lodging and agency residence.

The Cifuentes economic model is marked by some very different features. Here, the restarting of the economy has resulted more from the arrival of project personnel and the opportunities for a more capable commercial infrastructure that has developed even more. This particular quality has brought about a strange inoperativeness in the municipality, which has budgets and municipal services planned for its counted population, but they are insufficient for the actual floating population. The town's legal population increased from 2,000 to about 3,500 inhabitants in slightly less than 7 years, to whom must be added a floating population of approximately 800 more. Its mayor notes that at present they lack the receipt of the compensation rate promised to a large extent by the previous agency for projects throughout the entire province by 1985, one received to a very small extent in the district and, particularly, in Cifuentes. "We are lacking an associated plan for spending that compensation rate, which would cause it to revert more directly to the area of influence of the powerplant, for which that economic compensation is entirely earmarked."

Nevertheless, the town of Cifuentes has had no connection with what happened a few years ago. The shops have proliferated, business establishments have been consolidated, churches have been restored and schools have been built; things which did not occur years ago. Cifuentes will also receive the main urban development area in which the powerplant technicians will reside, as they do not in Trillo: A total of over 200 dwellings will be arriving, added to the 150 built during the past 5 years.

However, to tell the truth these are not all advantages. The recovery of the pace has brought with it a certain amount of reheating of the economic machinery, and the price hikes and well-known inflation have appeared, raising the cost of living, particularly that of services and rents; although, on the other hand, there has been a larger supply and overall volume of products for sale in the establishments.

Disappearance of Unemployment

Both corporations, that of Trillo and that of Cifuentes, agree in stating that probably one of the most beneficial effects of the project in the area has been the disappearance of unemployment and of concealed unemployment situations, stemming from jobs with a very low degree of productivity. The available figures warrant the claim that about 1,500 individuals from the powerplant's area of influence, virtually 30 percent of the active population of Alcarria Alta, are working on the project. To be added to this figure is an entire series of jobs that have been prompted, resulting from the spending of the working population contracted by companies and the public works activity carried out by the town halls.

These statistics assume greater significance when one considers the phenomenon of the transfer of labor from preeminently agricultural and livestock jobs to employment of an industrial and services type. In view of the meager traditional productivity of agriculture in the area and the dependence on weather factors which have never ensured a regular flow of income, the new jobs mean greater productivity and more security regarding income.

The concern of the mayors of Trillo and Cifuentes at present lies in maintaining the employment once the project is completed. There will obviously be noted here the stoppage of the second group that would have entailed the continuation of this state of growth and employment for another 10 years; but, nevertheless, they admit that the Trillo I Powerplant will mean direct employment for over 300 individuals, probably the industrial establishment of greater employment throughout the entire province and the creation of other service jobs for the plant or jobs generated by its employees and their respective families. The planning of retraining courses for the workers in the area who have already participated in the projects will allow for their maximum incorporation into future phases of powerplant operations. The municipality of Cifuentes itself, as well as the more distant one of Brihuega, is studying the possibility of establishing an industrial estate capable of attracting small industries.

The Keys to a Favorable Attitude

The changes in the advantages and disadvantages that the Trillo Powerplant is bringing to the area or will bring it in the future show a definitely favorable result which, apart from the debate that it is being attempted to impose on the controversy regarding the establishment of nuclear powerplants, will make it possible to compare two alternate models of economy and society: one that is tendentious and autonomous, determined by historical constants, which has sufficiently proven its inability to eliminate the retrogression, emigration and gradual abandonment of the area; and another one, progressive and dynamic, discerning in industrialization a supplementary prospect, a key to the diversification of production and the definitive thrust toward steady growth, with foreseeable benefits that will afford a clear opportunity for incorporation into levels of prosperity consistent with those of the rest of Spain. There is no doubt that the construction of the Trillo Powerplant is part of this second model.

Although this economic balance is one of the keys for understanding the favorable attitude toward the powerplant that is being expressed at present, it cannot be understood in all its breadth without the upright, honest informational policy carried out by the heads of the Trillo Powerplant itself aimed at the surrounding population.

From the outset, the Trillo Powerplant proposed as a priority matter the establishment of an open line of communication, operating in both directions, with the public in general and, more specifically, with the people inhabiting the district in which it is established. The purpose of this "hot line" is, and will continue to be, to assume a social responsibility for truthful reports on nuclear energy its participation in our country's energy context, the type of project that is being carried out and how it is being carried out, with statements on its operation, and its socioeconomic contribution to the area's development; as well as to anticipate and dispel the worries that the project might arouse. In short, to make the residents of the area feel that the powerplant is something of their own, and to achieve a suitable integration of it into its habitat; an integration whose best guarantee of success, and this has been quickly grasped, is the perfect operation, a few kilometers away, in Zorita, of the Jose Cabrera Powerplant, which has been operating without any mishap since 1968, the year of its opening.

The Powerplant's Information Center

Most particularly noteworthy among the informational activities has been the operation since 1981 of an Information Center of a permanent type at the powerplant.

It involves a preeminently instructional exposition wherein the visitor's participation is sought, not only so that he may observe everything offered there, but also so that he may participate and understand. All of this is done in a realistic atmosphere, capable of submerging the spectator into that dynamic world of energy in action. By means of models, audiovisuals and panel discussions, the visitor is offered an interesting view of the world of energy.

One of the most significant aspects of the Information Center is its opening concurrently with the powerplant's projects; in other words, they did not wait for the entry of the nuclear plant into operation to open it to the public and thus begin its mission as soon as possible. From this standpoint, it is unique in Spain.

Over 20,000 persons have already visited the Information Center. Starting with the area's residents, followed by universities, technical schools, high schools, professional associations, housewives, retirees and many others have in this way learned about all aspects of energy in general and nuclear energy in particular; and, more concretely, about the Trillo Powerplant. At all times it has supplied balanced information, respectful of the individual, which is interpreted as an asset and an essential project.

Current Status of the Work

Like other powerplants of nuclear origin, the group of buildings can be divided into two units, as follows: The first one would consist of the reactor, auxiliary, electrical, turbine, solid waste and emergency supply buildings on which a total of 92 percent of the construction work has been done, with the installations started; while the second unit is comprised chiefly of the demineralization, diesel, storage, shop and closed circuit cooling tower buildings. The construction work on the latter is 75 percent finished.

Reactor Building

The construction work on the reactor building is currently taking 88 percent of the time called for according to the basic plan. The metal sphere covering the inside of this building is about 65 percent installed, having taken for its construction to date 225,000 hours, during which 3,500 linear meters of welding have been completed. The installation of ventilation ducts is 25 percent completed.

Electrical Building

The construction work on this building is virtually finished. At present, work is being done on installation. In the ventilation system, they have installed 65 percent of the total number of kilograms called for in ductwork, having installed 95 percent of the number of supports used for electric wiring and lines and 50 percent of the pipework for mechanical systems.

Turbine Building

The building's metal structure is completely finished, with 6,100 tons of iron used on it for the different beams installed. The pedestal of the turboalternator has also been concreted.

Emergency Water Supply Building

The construction work on it has been completed.

Auxiliary Building

About 95 percent of the total number of hours planned has been spent on the construction work, all of it on the installation of 97 percent of the kilograms of reinforcement and cubic meters of concrete.

Diesel Building

Approximately 20 percent of the total number of hours needed for its construction have been used.

Demineralization Building

With its construction phases completed, at present work is being done on the installation phase, having installed 10 percent of the total length of pans, 2 percent of the pipework and 26 percent of the ventilation ducts.

Facilities for Cooling

These facilities consist of the circulation pump house, the essential services pump house, the impounding dam, the pumping station, pipework and natural draft towers. The construction phases of these facilities, with the exception of the two towers, as a whole, have taken 60 percent of all the hours called for. As for the cooling towers, their present status is as follows: The west tower's construction phase is completed and about 55 percent of the east tower is built.

Service Substation and Facilities

With the work completed on storage facilities, shops, etc., the substation has 45 percent of its total construction phase finished.

Finally, and as more significant data, about 32,500 tons of reinforcement have been used, representing approximately 80 percent of the total estimated; and 179,000 cubic meters of concrete, representing 87 percent of the total; as well as 275,000 square meters of forms, representing 80 percent of the total planned. For all this, over 30 firms are cooperating in the various construction phases, giving employment at present to about 3,650 persons, of which group over 75 percent are specialized personnel. Lastly, nearly 15.5 million man-hours have been worked, representing over 50 percent of the total estimated, according to the original plan of 30,633,400 man-hours.

Socioeconomic Indicators of the Trillo Powerplant's Area of Influence

	Brihuega		Cifuentes		Sacedon		Trillo		Total		%
	1976	1983	1976	1983	1976	1983	1976	1983	1976	1983	
Population	4,237	3,335	1,561	3,450	1,928	2,150	1,261	1,547	9,987	10,482	16.6
No of telephones	235	670	199	458	306	383	84	178	824	1,543	87.3
No of trucks	78	72	48	92	40	25	13	27	179	216	20.7
Municipal budgets (1,000s)	6,500	52,000	1,957	22,000	3,500	35,000	1,000	54,000	12,957	163,000	
											%
											1,158.0
No of banking entities	1	2	-	3	-	1	-	-	1	6	500.0
Savings banks	2	3	2	2	2	2	1	2	7	8	14.3
Commercial licenses	73	79	50	74	55	145	13	24	191	315	64.9

The Trillo I Powerplant: Technical Data

The Trillo I Powerplant is conceived as a basic powerplant, in other words, one with uninterrupted operation and hence capable of ensuring an installed power with a constant availability. This type of powerplant reduces the oscillations in available installed power represented by the pluviometric oscillation to which Spanish rivers are subject. At the same time, it affords a cheap, effective substitution for hydrocarbons in generating electricity, contributing decisively to the fulfillment of the goals of the energy policy and to the reduction in the balance of payments deficit. When it goes into operation at the end of 1987 it will represent a savings of 1.5 million tons of fuel oil per year.

The reactor that will equip the powerplant is of German KWU design and of the pressurized water (PWR) type, cooled by water in a closed circuit, with two cooling towers.

Power

Thermal power of the reactor	3010 MW (th)
Thermal power of the steam generator	3027 MW (th)
Gross electric power	1041 MW (e)

Reactor Core

Core diameter (equivalent)	3453 mm
Core height (active)	3400 mm

Total U weight (initial load of the core)	82,836 Kg
Enrichment levels (initial load of the core)	3.2; 2.5; 1.9% of U-235 weight
Fuel Elements	
Number of fuel elements	177
Total length	4,185 mm
Weight of one fuel element	730 Kg
Fuel	UO ₂
Number of rods	236
Coating material	Zircaloy 4
External coating diameter	10.75 mm
Internal coating diameter	9.3 mm
Diameter of the cake	9.11 mm
Control Rod Sets	
Number of control sets	52
Number of control rods in a set	20
Length of the absorbent material	2,480 mm
Reactor's Cooling System	
Number of cooling circuits	3
Total volume of flow of the cooling medium	15,875 Kg/s
Temperature upon entering the reactor	292.9°C
Temperature upon leaving the reactor	325.7°C
Service pressure	158 bars
Reactor's Pressure Vessel	
Internal diameter	4,878 mm
Thickness of the wall	245 mm
Total height	11,039 mm
Design pressure	176 bars
Design temperature	350°C
Net weight (without internal components)	429,000 Kg
Steel Containment	
Diameter	53 m
Thickness of the wall	38 mm
Design pressure	5.3 bars
Design temperature	145°C
Turbine	
Type	1 AP turbine with steam condensation, 3 BP double flow turbines

Rotating speed	3,000 rpm
Main steam pressure at intake of the turbine	66 bars

Alternator

Effective power	1,041 MWe
Power factor	0.9
Frequency	50 c/s
Voltage at the terminals	27 kV

The Vandellós II Nuclear Powerplant

The Vandellós II Nuclear Powerplant has been designed and constructed by the Catalanian Electric Companies forming the Vandellós Nuclear Association.

The companies' participation is as follows:

Ribagorça National Hydroelectric Enterprise, Inc (ENHER).....	54%
Catalonian Hydroelectric, Inc (HEC).....	28%
Segre Hydroelectric Power, Inc (SEGRE).....	10%
Electric Power of Catalonia, Inc (FECSA).....	8%

The Vandellós II Nuclear Powerplant is located in Tarragona Province. The powerplant is situated on the shores of the Mediterranean Sea approximately 40 kilometers south of Tarragona. The closest urban center is the town of Hospitalet del Infante, located approximately 6.5 kilometers northeast of the site.

The site is located between freeway A-7 and the sea, Barranco de Lleria and the area known as Malaset.

The facility is equipped with a light pressurized water nuclear boiler the rated power of which is 2,785 Mwt, which supplies a turboalternator set with an approximate power of 980 gross Mwe.

It has three cooling circuits, fuel in the form of slightly enriched uranium dioxide and auxiliary systems and technological safeguards, all designed and provided by Westinghouse Electric Corp.

The INITEC and Bechtel Power Corporation firms have become associated jointly and with solidary liability to execute the powerplant's basic and detail engineering design.

In fulfillment of the legal regulations and, specifically, the Regulations on Nuclear and Radioactive Facilities, the electric companies requested and procured:

1. The prior authorization for the powerplant of 27-2-76, which represents recognition of the suitability of the proposed site.

2. The authorization for its construction, dated 29-12-80, after a detailed technical analysis of the facility's design and its nuclear safety by the General Energy Directorate and the Nuclear Energy Board.

Through a resolution of the General Energy Directorate dated 9 May 1981, the declaration of public utility was granted.

Once the construction permit had been procured for the powerplant, action was taken at the Vandellos Town Hall to procure the municipal license for works projects and excavations, in compliance with the Regulations on Disturbing, Unhealthy, Harmful and Dangerous Industries, procured on 21-7-81.

On 30 March 1984, the Ministry of Industry announced for the nuclear powerplants projects the go-ahead to continue with their construction, in connection with the proposal to revise the government's National Energy Plan (PEN), included in which is Vandellos II.

Status of the Project Work

Up until the time of the procurement of the construction permit in December 1980, preliminary work was done on the construction per se, such as clearing of land, grading, excavation, offices, water supply, electric power, etc., basically during 1977; later, at the end of 1977, there was the first phase of the pouring of lean concrete for fill, replacing soil; and then the second phase of that pouring and the excavating and concreting under the water table in the turbine building area.

It is important to stress the phase of conducting the geotechnical studies of the site area, the start of which ended the phase of geological studies of a general local type, the first results of which were sent to the General Energy Directorate, forming part of the preliminary safety report on the powerplant dated 11-9-1976.

The geotechnical study was completed in its first phase on 30-8-1977, with the viability of the site reaffirmed, once all the boring activity had ended.

The beginning of the installation of reinforcement which precedes the pouring of structural concrete took place on 1-6-81, and the pouring of structural concrete started after the license for projects and excavation had been procured from the Vandellos Town Hall (21-7-81).

The program had a duration of 66 months at the outset, from the date of the first structural concrete to the loading of the fuel in the reactor. That program has been complemented by an engineering program and another for supplies. As may be inferred from the previous duration, the strict fulfillment of the program will put the Vandellos II project on the same level as the projects in the world with more adjusted construction programs.

On 29 December 1980, the date on which the construction permit for the Vandellos II Nuclear Powerplant was procured, the organization of activities on the

project was aimed at achieving the start of reinforcement installation (1 June 1980), which would make it possible to pour structural concrete immediately after procuring the license for projects and excavation from the Vandellos Town Hall (21 July 1981).

On 23 July 1982, the "ONIM" (Organization for Nuclear Island Mounting) contract was signed with Spanish Nuclear Westinghouse for the participation of Westinghouse technicians in the management of the mounting of the nuclear island and the opening of the powerplant, integrated into the Vandellos Project Management Organization.

During July 1982, the manufacture of sections of large piping (spools) began, making it possible to start the installation of piping in the auxiliary building on 1 December 1982.

During July, the contract was signed with VANEA (Vandellos Associated Business Owners) for the execution of the construction work on the powerplant.

During the fourth quarter of 1982, the permit was procured from the Generalitat to pour cooling water at the powerplant.

Also initiated at the year's end were the activities involving the preparation of the final safety report on the powerplant, in order to meet the pertinent conditions for authorization of construction.

The degree of progress in the project engineering by the end of December 1983 totaled 78.12 percent.

In December 1982, the mechanical mounting of the nuclear island, the air conditioning and the electrical systems were started.

In July 1983, the draining of water from the pump house waterproof area was done, as well as the installation of the last cylindrical part of the liner.

During the fourth quarter of 1983, the construction work ended on the sub-building and access tunnel to the auxiliary building.

In March 1984, the polar crane was installed in the containment building, and the first section of the dome was installed on that building. Also during that month, the installation of smaller 2-inch piping began on the nuclear island.

At the end of March, the total progress on the contracted work was 96 percent.

The manufactures and deliveries of equipment totaled:

Piping.....	71.78%
Mechanical equipment.....	81.6%
Electrical equipment.....	62.1%
Total equipment.....	77.4%

In September 1983, the total of 100,000 m³ of structural concrete poured was attained.

The total progress on construction by the end of March 1984 was 46.01 percent.

A total of 134,000 m³ of structural concrete have been poured on buildings and outer areas.

The different degrees of progress are shown below:

Forms, Reinforcement and Concreting (EAH)

The degrees of progress are as follows:

Containment building: 81.64%

Auxiliary building: 100%

Building for access to the auxiliary building: 100%

Control building: 100%

Penetration building: 87.33%

Cat-diesel building: 93.62%

Fuel building: 78.57%

Turbine building: 95%

Equipment building: 100%

Circulating water: 54.55%

External areas: 41.81%

Waste building: 44.69%

The original progress on the total EAH is 71.50 percent.

Surfacing Plates

Sheathing of the containment building: 95%

The original progress on surfacing plates on all buildings is 88.30 percent.

Metal Structures

The progress by buildings is as follows:

Containment building: 60%

Turbine building: 45%

The original progress on metal structures is 44.2 percent.

Total Progress on Construction Work

The original total progress in the construction work is 65.91 percent, including EAH, surfacing plates, metal structures and architecture.

Mounting

The status of the progress on mounting at the end of March was as follows:

Mechanical mounting, nuclear island: 15.97%
Mechanical mounting, conventional island: 14.92%
Electrical mounting: 14.85%
Air conditioning mounting: 20.72%

The original total progress is 14.69 percent.

Features of the Powerplant

The Vandellós II Nuclear Powerplant has been designed for a rated power of 2,785 thermal megawatts (MWt), including the 10 MWt provided by the reactor's cooling pumps. This power corresponds to a turbogenerator power of 982 MWe.

However, the nuclear steam supply system is capable of providing approximately 2,910 MWt.

Despite the fact that the rated power is 2,785 MWt, all the safety systems, including the containment and the technological safeguards, are designed and evaluated for operation at the level of 2,910 MWt.

Containment Building

It contains, among other things, the vessel and system for cooling of the reactor, steam generators, the reactor's coolant pumps, the pressurizer, storage tanks, containment air coolers and hydrogen recombiners.

Auxiliary Building

It holds mainly the technological safeguards systems and some equipment of the auxiliary systems.

Turbine Penetration Building

It houses the pumps and piping of the auxiliary water supply system, the steam generator draining system and lines for steam and the main water supply.

Turbine Building

It contains the turbogenerator set, condensers, main water supply pumps and other equipment necessary for the conversion of energy.

Fuel Building

It holds the new and used fuel storage pools, the transfer channel, fuel handling equipment, caves and equipment for handling and cleaning the cask,

the cooling and purification system for the fuel cave and emergency ventilations units for the auxiliary and fuel buildings.

Control Building

Located in it is the main control room, class IE electric equipment, class IE electrical batteries and parts of the system for making the control room as well as the remote stop room habitable.

Technical and Diesel Technical Backup Building

This building is a rectangular structure with three basic sections. Each of the two sections at the ends contains a diesel generator with its associated equipment. The central part holds the technical backup room with the computer room. The building also contains components of the control room's CVAA system.

Components Cooling Building

It contains the pumps and exchangers of the components cooling system.

Pump House

It contains the circulating water pumps, pumps for the essential services water, pumps for non-essential services water, the moving grids system and the grid washing system.

Radioactive Waste Building

It houses the equipment for the radioactive waste treatment systems and some components of the boron recovery system.

Equipment Building

It contains the essential diesel generator and the non-class 1E electrical systems.

Waste Solidification and Storage Building

Outer Areas

There are various tanks, such as: reload water storage tank, condensate storage tank, backup water tank for the auxiliary water supply system, fuel tank for the diesel generators, water tank for the fire protection system and demineralized water tank, among others, as well as transformers and equipment associated with the powerplant's electrical system.

The layout of the powerplant's buildings follows the logical arrangement of the SNUPPS projects in the United States, devised to incorporate the experience accrued from more advanced nuclear powerplant projects.

Hoisting the Dome

It was decided to carry out the maneuver for hoisting the dome of the containment building in two stages, through prefabrication of two large parts on the site itself, on ground level.

The first one was a spherical crown 40 meters in diameter, 11.18 meters high and weighing 192 metric tons, including fittings. The second one was a spherical shell 8.81 meters high with a diameter on the circle of the base of 33.16 meters.

The weight of the shell, including the sprinkler pipework was 161 tons, which gives an idea of the magnitude of the hoisting operation; because this shell is part of the hemispheric dome, which has a diameter of 40 meters.

In connection with the planning of the maneuver, account was taken of the experience and recommendations from a similar operation carried out at C.N. de Vogle, of the U.S., at a 1,125 MWe PWR owned by Georgia Power.

At that powerplant, the dome was hoisted in a single part. The applicable standards were ANSI No 45.2, 45.2.3 and 45.2.15. The total weight of the dome, including the sprinkler pipework of the sprinkling system, was 500 metric tons, and a 700 metric tone Lampson hoist was used. The number of suspension cables on the dome was 20, and the maneuver took a total time of 2 hours and 15 minutes.

The inspections and tests made on the equipment were analyzed, as were the maneuvering procedure and the dynamic tests made on the hoist and cables.

At the River-Bend Nuclear Powerplant, the structure collapsed, and among the reasons given for the accident were the wind and the lack of coordination for the maneuvers; no functional test had been made before the maneuver, and the hoist and dome were thrown to the ground, with the yoke splitting as a result. The impact on the program was assessed as a 5-month delay.

At the Vandellos II project, the goal pursued was to avoid unforeseen occurrences and contingencies, reducing the maneuvering time and the risk of a weather change.

On the date planned, they undertook the installation on site of a 4600 Manitowoc crane with ringer, with a capacity for the maneuvering radius of 197 metric tons, a maneuvering radius of 44.8 meters, a boom length of 260 feet = 79.24 meters, a pivot length of 80 feet = 24.38 meters, a deviation of the pivot with respect to the boom alignment of 6° and a height to which the load is raised of 43 meters.

Particularly noteworthy among the conditions required for the maneuver is the condition of the wind above the part, with a maximum acceptable speed of 25 kilometers per hour during the maneuver, and all the tests on load and END made before the maneuver, including a weighing of the part.

The maneuver was attempted on 13 March, but it had to be stopped at 1200 hours because during the interval from 0900 to 1200 hours, the winds reached figures exceeding the established limit.

(At the HIFRENSA [French-Spanish Nuclear Energy Co, Inc] Weather Station, during that period winds of up to 46.5 kilometers per hour were recorded, which involves a figure exceeding 60 kilometers per hour at the top of the containment building.)

During the maneuver a brief light rainfall occurred and the wind speed at the HIFRENSA Weather Station had a maximum figure of 9 kilometers per hour, which could correspond to a maximum figure of 15 kilometers per hour at the upper portion of the containment building.

The remarkably low figures for wind during the most critical part of the maneuver, associated with the hoisting and revolving of the part until its placement on the building occurs, were noteworthy.

Also to be stressed was the perfect connection between the dome part and the building liner, in view of the minimal ovaling that existed and the virtual coincidence of both structures (a difference of 5 mm out of a total of 125,664 mm), resulting from the good preassembly work that was done).

The timetable for the maneuver (on 15-3-84) was as follows:

0940 hours: Hoisting begins
1018 hours: The planned height is reached
1023 hours: The revolving begins
1030 hours: Stop to change position of the ropes
1038 hours: The revolving is resumed
1048 hours: Stop on the vertical line of the containment building
1120 hours: The placement of nails for the connection begins
1210 hours: The grommets are untightened
1257 hours: The grommets are released
1300 hours: Return of the Manitowoc 4600 crane begins
1320 hours: The crane is released from the yoke and turned to the rest position supporting the boom

About 1000 hours on the morning of 12 March, the hoisting of the spherical shell which, when assembled over the foregoing part, would constitute the closure of the building's dome, was undertaken.

The shell included, already preassembled, all the sprinkler pipes of the sprinkling system, and was connected to the former part with minimal ovaling and also a virtual coincidence of parts.

Before those two operations took place, during the first half of March, also with the help of the aforementioned crane, the hoisting of the two beams and the polar crane truck of the containment building took place, as may be observed from the graphic information that is included herein.

The La Robla Thermal Powerplant

The La Robla Thermal Powerplant is part of the Orbigo System, and is located on the banks of the Bernesga River, from which it draws water for its cooling circuit.

To ensure the necessary volume of flow for cooling the two groups during the low-water period, the Casares dam, located at the Casares de Arbas municipal terminal, is under construction, planned for completion in 1984.

The powerplant consists of two groups with 270 and 350 MW power, respectively, and occupies land situated at the La Robla (Leon) municipal terminal.

The features of the main equipment are summarized below.

Group II

Like the third Narcea Thermal Powerplant group, with a time difference of about 6 months with respect to the latter, the Group II project at the La Robla Thermal Powerplant was started. There, a 270 MW power group, of which Foster Wheeler is the boiler manufacturer, together with Land and Sea Machnism, the latter being a firm which also manufactured the turboalternator with Brown Boveri (of Baden), which was awarded this package, has been in operation since 1971.

The Group II project has received the benefits of joint action with the electrical sector, with the special act for its execution signed in October 1980.

In February 1982, the boiler for this second group was awarded to Balcke Duerr, which carried out the joint manufacture with Associated Mechanics, while the turbogenerator package was awarded to the firms Siemens, Bazan National Enterprise and Kraftwerk Union, also in February of the same year.

This second La Robla Thermal Powerplant group has some features visibly identical to those of Narcea III, insofar as the powerplant plan is concerned, differing only in fuel; because Narcea III is designed to burn anthracites and this group, a mixture of coals and anthracites of a quality superior to the former.

Another notable difference between the two, though not with regard to plan, is the need for building at the Casares Municipal Terminal the dam with this same name, in order to ensure the minimal volume of flow of water to cool the two La Robla groups during low-water periods.

As for the equipment of this Group II, we shall note that it has a turboalternator the manufacture of which was assigned to the firms Kraftwerk Union, Siemens and Bazan National Enterprise, with the following features: An "action-reaction" turbine with a number of extractions amounting to seven;

it provides a steam temperature of 537° and the final temperature of the water supply is estimated at 245°. The acceptable steam pressure is 166.5 Kg/cm² .

Its power is reckoned at 350 MW and it generates a velocity of 3,000 rpm.

It only remains to be added that the generation voltage is 21 KV and the power factor is 0.9. The cooling of the alternator is carried out with H₂ .

Boiler

Its manufacture was handled by the Balcke Duerr Company. With a type of structure designed for outdoors, it has a steam production of 1,143 tons per hour, and a steam pressure at the superheater outlet of 176 Kg/cm² .

It is supplied with 24 burners and six ball-type crushers. Its fuel supply will consist of coal and anthracite. The number of air preheaters is 2 + 2, of the L. Jurstron type.

The substation transformers were manufactured by Westinghouse, and the main one reaches a power of 4 X 139 MVA, with a transformation ratio of 22/435 ^x KV= 15%, supplemented by two other auxiliary units with a power of 40 MVA, a ratio of 23/6.6 KV and 10 interconnected line outlets.

We can cite the following events in the development of the project, simultaneously carried out with Narcea II:

- Award for the main engineering, February 1980
- Award for the main transformers, February 1981
- Beginning of the main construction work, August 1981
- Award for the boiler mounting, December 1981
- Award for the pipework package, December 1981
- Award for the cooling tower, February 1982
- Beginning of the boiler mounting, May 1982
- Award for the smokestack, July 1982
- Award for the turbogenerator mounting, July 1982
- Award for the ash system, July 1982
- Award for the coal system, July 1982
- Award for the electrical installation, September 1982
- Award for the miscellaneous mechanical mounting, December 1982
- Award for the construction work on the Casares Dam, May 1983
- Award for the instrumental and control installation, July 1983

At present, the different bidding competitions are continuing, and they have started requesting the responses.

The construction work is continuing at a good pace, with the completion of the smokestack and the finishing of the cooling tower. The turbo-feeder building has all its rough-plastering work finished and work is being done on the

closures and partition layout of the inner rooms. In the grinder shed the activities involving forms, ironwork and concreting of the hoppers are continuing, but they are now very far advanced.

As for the status of the mounting, work is continuing on the boiler, with the hydraulic test planned at the end of this September; and the preheaters and electrofilters are nearly finished. The mounting of the turbogenerator is occurring normally, and the electrical mounting is now concentrated mainly on laying the plans and supports, currently quite advanced, with the laying of the first cables started.

At the Casares Dam, all the excavation is now completed, both for the body of the dam, and the stilling pool; and the concreting has already begun. Based on the anticipated project plan, the connection of the La Robla Thermal Powerplant's Group II will take place during the second half of next year.

Group II Boiler Pressure Test

On 20 September of last year, the hydraulic test was conducted on the high pressure circuit of the Second Group's boiler.

The test was witnessed by the honorable provincial director of the Ministry of Industry and Energy, Miguel Casanueva, and was taken satisfactorily, meeting all the requirements stipulated in the regulations currently in effect.

This test which, as we know, is a major milestone in the thermal group's construction, consisted of subjecting the steam generator to a pressure one and a half times higher than the maximum for operation (194 Kg/cm^2), in other words, to 291 Kg/cm^2 , for a minimum period of 30 minutes.

In the on-site test, in the presence of authorities, only five leaks were found, four from manufacture and one from mounting; constituting a real success, even on the international level, considering the fact that about 90,000 welds were made on the boiler, 35,000 of which were made on site.

The boiler was designed by the German firm Balcke-Duerr, and manufactured by La Pena Mechanics (Bilbao), 85 percent; it was mounted by the group of companies Abengoa-Copisa (Abeco), under UEF's supervision, with technical advice from Balcke-Duerr. The destructive and non-destructive tests were handled by CIAT and Eurocontrol.

The mounting started in May 1982, and the period up until the hydraulic test was a complete success. It should be noted that, during this interval, about 16,000 tons were mounted and 35,000 welds made.

Some of the most significant data regarding this boiler are: live steam volume of flow: 1,143 tons per hour; bell pressure: 194 Kg/cm^2 ; live steam temperature: 541°C ; outlet pressure of the final superheater: 176 Kg/cm^2 ; steam temperature at the outlet of the intermediate reheater: 46.2 Kg/cm^2 ; and volume of flow of the steam at the outlet of the intermediate reheater: 926 tons per hour.

To top off the success achieved, on 23 September an official ceremony was held on the site, attended by the honorable provincial director of the Ministry of Industry and Energy, and high-ranking board members from Balcke-Duerr, Abeco, La Pena Mechanics, groups of businessmen, our company and others, with our general director of new investments, Eduardo Diaz Rio, officiating at the function. He delivered some remarks, reviewing the gains made, and giving encouragement for continuation along the same path.

At noon, Balcke-Duerr was the host at the Abeco dining halls on the site, with a splendid meal that constituted a nice gesture of fraternal relations among all the companies participating in this work.

The Accelerated Program

The group of powerplants in the accelerated program, of which the following are a part: Lada IV, in service since 1981 (CEL-HE); Compostilla IV, in service since 1981 (ENDESA); Anllares, in service since 1982 (UEF); Narcea III, soon to go into service (UEF); Soto III, going into service this year, 1984 (EV, HC, CEL-HE); La Robla II, which will go into service in 1985 (UEF); Guardo II, by 1985 (ID, EV), all with 350 MW; and Los Barrios I, with 550 MW, for 1985 (CSE); Abono II, with 540 MW, for 1985 (HC); and Carboneras I, with 550 MW (ENDESA) for 1985, represent a combined power of 4,050 MW, and when they go into operation they will replace 6.1 million tons of oil. The investment planned for this program amounts to 240 billion pesetas, having ensured jobs for 24,632 man-years until the end of this year.

Cofrentes

The rate of increase in electric power consumption in this region which exceeds the national average during the period 1973-83 by over 14 percent, with an average interannual rate of increase anticipated at 5.7 percent for future years, will be considerably reduced upon the opening of this powerplant, a twin of the one in Leibstadt, Switzerland, which is currently in operation.

Electric Power in the Valencian Autonomous Community

The dynamism of the Valencian economy has been reflected in the community's electric power consumption which, during the decade 1973-82, increased 67.5 percent, in comparison with 53 percent on the national level during the same period. For the aforementioned decade these increments represent average interannual growth rates of 4.8 percent for all Spain and 5.9 percent for the Valencian Autonomous Community.

This tendency is continuing at present, and it is expected that, during the next few years, the rise in the community's electrical consumption will reach about 5.7 over every previous year; whereas for the nation as a whole it is estimated at 4.75 percent.

On the other hand, the community's own production facilities are currently inadequate. They are virtually concentrated at the Castellon Thermal Powerplant, which accounts for 74.5 percent of the total installed power. This

powerplant, which uses fuel-oil as fuel, produced 5.0288 billion kWh in 1982, representing 91 percent of the electric power generation within the community.

The amount of energy that can be produced during an average year in the three hydraulic basins of the community is 1.265 billion kWh, distributed as follows:

Jucar: 1,070 billion kWh
Mijares: 150 million kWh
Turia: 45 million kWh

Owing to the severe drought in recent years, the Castellon thermal powerplant has had a very high degree of utilization, since it is one of the plants with the least specific fuel consumption in the national system. On the other hand, during wet years the use of Castellon has been less, and the shortage of electric power in the Valencian Autonomous Community has been considerably larger.

This shortage situation will be solved by the entry into service of the Cofrentes Nuclear Powerplant, which is equipped to load the fuel in the reactor soon. All this leads one to assume that the power produced by Cofrentes may start being distributed through the national system during the course of this year.

The connection of this powerplant to the system will serve to meet the community's demand for electricity, also improving the conditions for use of the Eastern electrical system.

Within this very decade of the 1980's, the entry into operation of the Cortes La Muela hydroelectric development will consolidate Cofrentes' incorporation, through another contribution of hydraulic power and the supplement of a pumping plant. In fact, a pumping development is more beneficial the closer it lies to a nuclear powerplant (of which it is an ideal supplement) and a major consumption center. Both circumstances occur in the case of Cortes-La Muela, which is only 10 kilometers away from the Cofrentes Nuclear Powerplant and 50 kilometers from Valencia.

The Spanish nuclear program calls for favorable repercussions on our energy consumption.

The Jose Cabrera, Santa Maria de Garona and Vandellos Nuclear Powerplants have been operating in Spain since 1968, 1971 and 1972, respectively.

Throughout 15 years they have produced 77.867 billion kWh, with an impeccable record insofar as safety is concerned.

The initial success of those powerplants and Spain's shortage of energy resources served as the basis for starting the second generation of nuclear powerplants, consisting of those in Almaraz, Asco, Cofrentes and Lemoniz. The opportunity of this program was curtailed in 1973, when the unprecedented rise in oil prices occurred, causing the so-called energy crisis the consequences of which currently extend to all economic sectors.

Despite the fact that, between 1973 and 1981, a great exporting effort was expended in Spain, registering an annual average growth rate of 24.6 percent in exports of goods and services in current pesetas, the balance in our merchandise, which has been systematically negative, has risen at the rate of 17.4 percent per year. The relative weight of net hydrocarbon imports has contributed to this considerably.

Spain, like the other countries that are net consumers of oil, has been engaged in a policy of saving and replacing petroleum products with other energy sources which, insofar as we are concerned, has actually been leading to a decline in the domestic consumption of crude.

Nevertheless, the combination of the price hikes and the deterioration in our currency have cancelled those efforts in economic terms, so that the negative balance in the foreign trading of oil, natural gas and petroleum products was increased at the rate of 45.9 percent per year, in current pesetas, during the period 1973-81.

All-Important Role of the Cofrentes Powerplant In Freeing Us From Oil Slavery

The measures adopted at the appropriate time to reduce that Spanish dependence on oil are contained in the energy plans. Prominent among the latter is the nuclear program, which is now starting to bring its results. The first unit of the Almaraz Nuclear Powerplant, in which Hidrola has a 33 percent share, started operating in 1981, and the second one virtually reached its full power during the first days of 1984. At Asco, the first unit started the nuclear tests in 1983; while Cofrentes should be starting them soon.

However, those four units cannot substitute for all the fuel oil consumption in thermal powerplants, which amounted to 6.849 million tons in 1982, equivalent to the full production from about six nuclear units the size of the four mentioned. The number of supplementary nuclear powerplants to be built before 1992 is being studied in the review of the National Energy Plan.

But the fact is that every week that elapses with the Cofrentes Nuclear Powerplant connected to the system at full power will mean a savings of 39,000 tons of fuel oil, at a current price of nearly 1 billion pesetas, in contrast to an equivalent nuclear fuel cost of 250 million pesetas. The possibility of this significant savings of foreign exchange will be the result of the effort made by Hidrola for 10 years to design and build the Cofrentes Nuclear Powerplant.

Requirements for Procuring the Permit for Provisional Operation, Nuclear Tests and Guarantee and Safety Controls

The permit for provisional operation (PEP), based on the definition per se in the Regulations on Nuclear and Radioactive Facilities (Art. 24), "gives the operator the capacity to conduct nuclear tests" at the powerplant. It is granted through an order from the Ministry of Industry and Energy, and is published in the Official State Bulletin.

The requester must provide the Ministry of Industry and Energy and the Nuclear Safety Council with the documents listed below, justifying the suitability of the powerplant and the qualifications of his organization to put it into operation:

1. Safety study, which must include:

- a. Supplementary data on the location obtained during the construction
- b. Description of the facility as such and how it has been built
- c. Analysis of the foreseeable accidents resulting from poor operation, mistakes in operation or those of external agents
- d. Radiological study of the facility, both in a normal situation and under accident conditions

2. Regulations on operation:

- a. List of personnel with nuclear responsibility and technical competence
- b. Organization and functions of the personnel, under both normal and unusual conditions
- d. Standards for operation and radiological protection in a normal and accident situation

3. Proposal for operating specifications, with the limiting values of the variables affecting safety, limits on action of the automatic protection systems, minimal operating conditions, program for periodic checking, calibration and inspection of the systems and components and operational control

4. Internal emergency plan, defining the powerplant's organization to respond to a situation of this type

5. Nuclear test program, which will make it possible to procure the data for evaluating the nuclear safety of the facility after the nuclear fuel has been loaded

6. Evaluation of the national economic participation in the total powerplant investment

After these documents have been received, the pertinent administrative processing and technical studies begin. Apart from this documentation, various local authorities devise the Provincial Emergency Plan, following the guidelines issued by the General Directorate of Civil Protection.

When all this information has been favorable assessed by the Nuclear Safety Council, and the prenuclear tests conducted satisfactorily, the Ministry of Industry and Energy will grant the permit.

Once the PSP has been procured, the operator will proceed to load the nuclear fuel in the reactor and to carry out the nuclear test program.

Before the powerplant goes into commercial operation, a nuclear test plan must be completed to make certain that the nuclear design and those of the power production systems in the facility are suitable.

The nuclear tests are conducted in several consecutive phases wherein the power generated by the plant is increased until it culminates in the tests at rated power. During the first phase, the initial critical state of the core is reached with an open vessel and without energy production, ascertaining whether the reactor's control and instrumentation systems operate properly.

Once the vessel has been closed, a series of tests at 5 percent power are made, later raising the power to as much as 20 percent. During this phase there occurs the first connection of the turbine and generator, and the synchronization of the system; hence the first electric power generation.

Before undertaking subsequent phases, an analysis is made of the data procured from each test and they are submitted to the Nuclear Safety Council so that, once they have been evaluated, it may give permission for the starting of a new series of tests, if appropriate.

These phases are marked by power levels of 35, 60, 75 and 100 percent power and by different conditions of the volume of flow through the core, as part of the so-called power program. Various triggerings of the reactor are made as part of the nuclear tests, to ascertain the suitable performance of its protection systems, culminating in tests of total loss of voltage and triggering of the turbine and generator.

The Cofrentes Nuclear Powerplant is subjected to the control carried out by the International Atomic Energy Agency (IAEA), in all matters relating to the use and possession of nuclear materials. IAEA, which comes under the United Nations and has headquarters in Vienna, is at all times kept apprised of the stocks of fissionable materials existing in the powerplant, their physical location therein and the use made of such materials.

This control is known by the name of safeguards and is completed with periodic visits and auditing by inspectors from the agency, who learn, "in situ," about the status of the nuclear materials existing in the powerplant. In addition, there is a constant surveillance using TV cameras installed and controlled by IAEA itself, which record all the operations involving handling of the fuel and other materials subject to safeguards, in order to make certain that they are not used for purposes other than those stated.

Let us briefly view the position and final operation which, as a conclusion to all the work and tests performed, constitute the real beginning of the energy utilization, namely:

Loading the Fuel in the Reactor

Once the permit for provisional operation has been procured, the loading of the fuel can be undertaken, involving a group of maneuvers the purpose of

which is to place in the reactor each of the 624 fuel elements that constitute the core in its previously studied and defined position.

To do this, the fuel elements, which have remained in dry storage in the fuel building, are individually inspected, channeled and put into the pools in the fuel building itself. From that time on, the fuel will always remain under-water.

Then the fuel elements are sent two at a time to the pools located in the reactor building.

This operation is carried out with a bent transfer tube leading to the aforementioned pools, which are located over the reactor's vessel, and allow access to the inside thereof once its cover has been removed.

Using a precision handling platform, the fuel elements are brought into their specific positions in the reactor, one by one, in a predetermined order. In this way the core is put into an arrangement in which fuel elements and control rods alternate with one another, a layout that will remain unchanged during a period of approximately a year, until it becomes necessary to reload the reactor with fuel. During this entire process, the control rods will remain inserted in the core.

After the loading of the 624 fuel elements has been completed and the tests with the open vessel made, the steam separator and the dryer will be placed in the open vessel, and next, the cover of the vessel, thereby leaving the reactor ready to start the nuclear power tests.

In 1984 (with all the legal red tape completed and the pertinent authorization procured), when the Cofrentes Nuclear Powerplant is added to the over 300 already operating in the world, a major step will have been taken in the effort to lend the Valencian Community an energy infrastructure that will afford its present and future progress. The Community is currently suffering from an annual electric power shortage exceeding 6 billion kWh, a shortage which is equivalent to or slightly less than the production to be generated by Cofrentes. This is an important item of information that should not be forgotten: No country or region that is seriously thinking about progress gives up energy plants that can guarantee its own energy.

Moreover, it should not be forgotten that, on the international level, in the area of energy consumption, electric power is gaining ground: It is estimated that the current proportion of 16 percent will have risen to 26 percent by the final (so close) years of this century.

This electricity, in turn, will be produced to a constantly increasing extent by nuclear powerplants: Reports from IAEA tell us that, in 1982, 21 new nuclear powerplants were connected to the system in 12 different countries. There is also a report that the Leibstadt Powerplant, in Switzerland, twin of Cofrentes, began loading the fuel on 21 April.

2909

CSO: 5100/2574

SWEDEN

LAST TWO REACTORS IN NUCLEAR ENERGY PROGRAM ARE LOADED

Stockholm DAGENS NYHETER in Swedish 29 Jun 84 p 8

/Text/ The government on Thursday authorized loading the reactors Forsmark 3 and Oskarshamn 3, the last two in the Swedish nuclear power program. The loading permit is valid through the year 2010.

According to Minister of Energy Birgitta Dahl it was a decision involving great responsibility but it was not difficult.

The applications for loading, which were submitted a year ago, are based on a report on nuclear fuel safety, KBS 3, which the nuclear power industry has produced.

According to KBS 3 nuclear waste shall be finally stored in copper capsules embedded in bentonite clay, 500 meters down in bed rock.

A new nuclear energy law was adopted this spring. The requirement for a completely safe final storage disappeared. Today instead one talks about a method which is acceptable in regard to safety and protection from radiation.

"We are not going around saying that this method is completely safe," Dahl says. "The final decision in selecting a method will be made considerably later on the basis of the research we will then have concluded."

The People's Campaign Against Nuclear Power urged the government on Thursday to re-evaluate its decision. It is felt, among other things, that the government should have awaited the results of the committee on the use of electricity recently established by the minister of energy.

The Left Party Communists are also protesting against the decision to load reactors 11 and 12.

6893

CSO: 5100/2576

BRIEFS

GOVERNMENT STUDYING EURATOM COOPERATION--On Wednesday, 30 May 1984, the government designated Curt Nicolin as an administrator with the task of evaluating Sweden's cooperation with Euratom, the European nuclear energy community, on nuclear fusion research. Professor Gunnar Hambræus and General Director Olof Hormander, who perform nuclear power inspections, will be experts in his group. The evaluation is to be ready by 1 October 1984. The evaluation is to throw light on the political and economic aspects of cooperation on research on nuclear fusion in Euratom and on the significance of cooperation on research on nuclear fusion from the international point view. The group is also to analyze the importance for the general scientific level and technical development in Sweden of Swedish participation in international research on nuclear fusion. Furthermore, the evaluation is to throw light on the significance of cooperation in research on nuclear fusion for Sweden's international relations and how people in other European countries and the EC evaluate that cooperation. [Text] [Stockholm SVENSKA DAGBLADET in Swedish 1 Jun 84 p 6]

9266

CSO: 5100/2569

NUCLEAR WASTE PROBLEM PROMPTS STUDY BY SELLAFIELD

London THE DAILY TELEGRAPH in English 8 Jun 84 p 3

[Article by William Barton]

[Text] IN launching a study of ways to bring the discharge of radioactive waste into the Irish Sea "to as near zero as possible," British Nuclear Fuels has bowed to public opinion and pressure, said its chairman, Mr Conn Allday.

He officially announced the top priority study in an address to the Sellafield Nuclear Engineering Society at the nuclear reprocessing plant on the Cumbrian coast near Whitehaven, last night.

The study will cover the practical measures required to cut discharges from the plant (formerly known as Windscale), the likely cost of implementing them, and the timescale for achieving them.

Mr Allday said: "We are acknowledging the strength of public opinion. I believe we can, by an open and frank discussion of our programmes and successes, which are major, establish overall public confidence in us and what we do."

Last year 30 miles of nearby beaches were closed when radio-active material was washed ashore after a leak from the plant. But last month MR Patrick Jenkin, Environment Secretary, said there was only a negligible risk following extensive monitoring.

'Cautious optimism'

Greenpeace, the environmental pressure group, welcomed the new study with "cautious optimism." Their spokesman, Mr Peter Wilkinson, stressed that British Nuclear Fuel, had pledged only to investigate if near zero discharges were possible.

He said: "An investigation with no action will not suffice and neither will near zero levels. We want zero levels and so do the public, here and abroad."

The group's local spokeswoman, Miss Jean Enery, from Barrow in Furness, said: "It is hard to believe it is happening after all these years."

The Labour environment Spokesman, Dr John Cunningham, whose constituency includes the nuclear plant, said he warmly welcomed the study. "Such a decision represents a major new development in thinking about the need to protect our marine environment," he said.

CSO: 5140/003

END